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ABSTRACT

These 32 learning guides are self-instructional packets for 32 tasks identified as essential for performance on an entry-level job in plumbing and pipefitting. Each guide is based on a terminal performance objective (task) and 1-4 enabling objectives. For each enabling objective, some or all of these materials may be presented: learning steps (outline of student activities) with necessary resources/materials cited, instruction sheet(s), and self-check with answer key. A performance test and/or a written test (with answer key) concludes each guide. Tasks covered in these guides include installing lawn sprinkler system and tank type water closet; fabricating a PVC joint; roughing in water, waste, and vent systems; digging and backfilling a trench; cutting cast iron pipe; cutting and threading galvanized pipe; replacing thermostat or heating element on electric water heater, kitchen sink faucet, and/or basket strainers, kitchen sink trap or disposal trap; thawing a frozen pipe; repairing leaking shower valve, waste, and overflow on bathtub, water closet, leaking water faucet or valve; bending, joining, cutting, flaring copper tubing; removing obstruction from main drainline, water closet, kitchen sink trap or disposal trap, lavatory drain; and setting a bathtub. (YLB)

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ED210429

PLUMBING AND PIPEFITTING
Student Learning Guides

D-07	Install a Lawn Sprinkler System
D-06	Fabricate a PVC Joint
F-01	Install a Tank Type Water Closet
D-05	Rough in Water System Using Galvanized Pipe and Fittings
D-04	Rough in Water System Using Copper Pipe and Fittings
D-03	Rough in Waste and Vent System Using Cast Iron Pipe
D-02	Rough in Waste and Vent System Using PVC Pipe
D-01	Dig and Backfill a Trench
C-10	Cut Cast Iron Pipe With a Chisel and Hammer
C-08	Replace a Section of Galvanized Water Service Line
C-07	Cut and Thread Galvanized Pipe
C-06	Join Copper Pipe to PVC Pipe Using Sweat Method
B-14	Replace Thermostat or Heating Element on Electric Water Heater
B-13	Thaw a Frozen Pipe
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C-05	Bend Copper Tubing with a Spring Bender
C-04	Join Copper Tubing to Steel and PVC Pipe
C-03	Cut and Flare Copper Tubing
C-02	Identify Copper Fittings and Pipe
C-01	Fabricate a Copper Joint
B-10	Repair a Water Closet
B-09	Repair Leaking Water Faucet or Valve
B-08	Remove Obstruction from Main Drainline
B-07	Remove Obstruction from Water Closet
B-06	Remove Lavatory Faucet and/or Pop Up Assembly
B-05	Replace a Kitchen Sink Faucet and/or Basket Strainers
B-04	Replace a Kitchen Sink Trap or Disposal Trap
B-03	Remove Obstruction from Kitchen Sink Drain
B-02	Replace a Lavatory Trap
B-01	Clear Obstruction from a Lavatory Drain
E-01	Set a Bathtub

CE 030 486

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VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Install a Lawn Sprinkler System

DUTY: Roughing in Plumbing

PURPOSE:

Many of today's homes have lawn sprinkler systems underground or have above ground systems installed. You should be able to install and service a lawn sprinkler system.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	D	07	

REVISED :

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order to install a lawn sprinkler system,

YOU WILL: install a lawn sprinkler system.

HOW WELL: You must score 100% on the Performance Test.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify steps in installing a lawn sprinkler system.
2. Install a lawn sprinkler system.

DEPT.	PROG.	DUTY	TASK
IN	9723	D	07

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in installing a lawn sprinkler system.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the procedure for installing a lawn sprinkler system.	1. a. Text: Plumbing, Third Edition, page 144. b. Text: Design of Plumbing and Drainage Systems, pages 80 - 87.
2. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	07	1

ENABLING OBJECTIVE NO. 2

RVTC

Install a lawn sprinkler system.

LEARNING STEPS

1. Using Resource No. 1 practice installing a lawn sprinkler system.
2. Evaluate your work by completing the Self-Check.
3. When you think you can perform this task, take the Performance Test.

RESOURCES

1. Instruction Sheet enclosed, Installing a Lawn Sprinkler
2. Self-Check enclosed.
3. Performance Test for task D-07.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	07	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Install a Lawn Sprinkler System

1. Lay out trench lines, considering desired amount of water overlap required for complete coverage.
2. Dig trenches for water lines.
3. Lay pipes, vertical tees and riser in trench for each sprinkler head.
4. Install header for sprinkler lines at main supply line, using nipples and tees.
5. Connect first sprinkler lines at main supply line and install a cut-off valve for supply line.
6. Install water supply line from first sprinkler supply to point of first sprinkler head.
7. Install vertical tee in sprinkler line.
8. Install riser in vertical tee.
9. Install sprinkler head on riser.
10. Follow steps 5 - 9 for each sprinkler line, installing cut-off valve in front of each line.
11. Cap end of each sprinkler line.
12. Test system for coverage.
13. Fill trenches.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	07	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below on a separate sheet of paper.

All items should receive a "YES" response.

	YES	NO
1. Were trenches properly laid out?	____	____
2. Were trenches dug so sod was not destroyed?	____	____
3. Were fittings laid out, where needed?	____	____
4. Was header installed in main water supply?	____	____
5. Were cut-off valves installed in lines?	____	____
6. Were cut-off valves installed in such a manner as not to wet you when the systen is turned on?	____	____
7. Were all sprinklers in operating order?	____	____
8. Was the right coverage achieved?	____	____
9. Were all trenches covered?	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	07	5

PERFORMANCE TEST FOR TASK NO. D-07

RVTC

IN-9723-D-07

TASK: Install a Lawn Sprinkler System

STUDENT'S NAME ____________________ DATE __________

DIRECTIONS TO STUDENT: You will install a lawn sprinkler system. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED For successful attainment ALL items must receive a "YES" response	YES	NO
1.	Were trenches properly laid out?		
2.	Were trenches dug so sod was not destroyed?		
3.	Were fittings laid out, where needed?		
4.	Was header installed in main water supply?		
5.	Were cut-off valves installed in lines?		
6.	Were cut-off valves installed in such a manner as not to wet you when the system is turned on?		
7.	Were all sprinklers in operating order?		
8.	Was the right coverage achieved?		
9.	Were all trenches covered?		

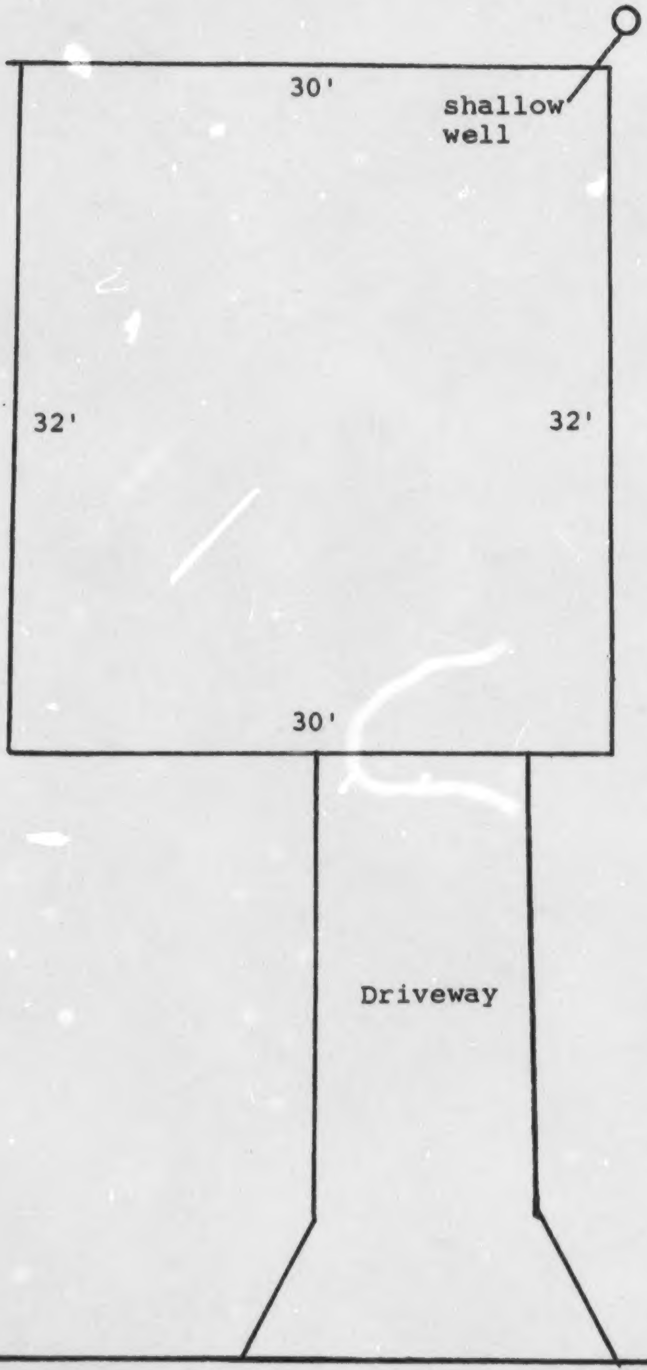
☐ ATTAINED

Score __________ ☐ NOT ATTAINED ____________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	D	07		Page 1 of 1

Install a Lawn Sprinkler System

Scale 1/8" = 1'. Draw in all lines and sprinklers , fittings and valves.


30'
shallow well
32'
32'
30'
Driveway

IN-9723-D-06

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7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Fabricate a PVC Joint

DUTY: Roughing in Plumbing

PURPOSE:

The correct procedure for fabricating a PVC joint cannot be overemphasized. This Learning Guide will assist you in understanding the proper installation procedures.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	D	06	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: P.V.C. pipe, tools and materials,

YOU WILL: fabricate a P.V.C. joint.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

ENABLING OBJECTIVES:

1. Fabricate a P.V.C. joint and test to 40 P.S.I.

DEPT.	PROG.	DUTY	TASK
IN	9723	D	06

ENABLING OBJECTIVE NO. 1

RVTC

Fabricate a P.V.C. joint and test to 40 P.S.I.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in fabricating a P.V.C. joint.	1. a. *Plumbing Installation and Design*, pages 108-111. b. Instruction Sheet enclosed, *Plastic Pipe*
2. Practice fabricating a P.V.C. joint and test to 40 P.S.I.	2. a. pipe b. tools
3. Complete the Self-Check.	3. Self-Check enclosed
4. When you think you can perform this task, take the Performance Test.	4. Performance Test for task D-06.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	06	1

INSTRUCTION SHEET

RVTC

PAGE 1 OF 4

Plastic Pipe

The use of plastic pipe is becoming common, particularly in locations where highly corrosive waste must be disposed of. Some industrial plants use plastic pipe for water-supply systems and lawn-sprinkling systems. Many new homes are using plastic for both supply and drain systems. Plastic pipe is available in rigid (threaded), semi-rigid and flexible types and sizes ranging from ½" to 6". Since there are many manufacturers, it is best to follow the directions and use the solvents recommended by the manufacturer of the plastic pipe you are using.

Plastic pipe, though widely used in industry, is not yet common in household plumbing, largely because local codes are slow to approve new material. Also, at present, only a few types can withstand hot water system temperatures.

The advantages of plastic pipe and its fittings are low cost, light weight, ease of assembly and high resistance to corrosive elements that can damage metal pipe. In its flexible form, (polyethylene), it has been widely used for quite a few years in deep wells. Its light weight and flexibility and the fact that it is available in continuous lengths as great as 1,000 feet make it an excellent choice for well use. It can be lowered into the well and removed when necessary almost as easily as garden hose.

In rigid form, plastic pipe has been accepted for certain applications by various state and local codes. It is gaining, for example, in waste-plumbing. If it's approved in your area and you plan to install the plumbing yourself in a new house, the lightweight plastic can make the large pipe drainage work much easier.

How to make plastic pipe joints. If you are using flexible plastic pipe for a well system, simply slip a metal joint clamp on the end of the plastic pipe, push the end of the pipe as far as it will go on (not into) the fitting and tighten the clamp. Standard fittings include elbows, T's, reducers and adapters to join plastic pipe to metal pipe. You can cut flexible plastic pipe neatly with a sharp knife or any fine-toothed saw.

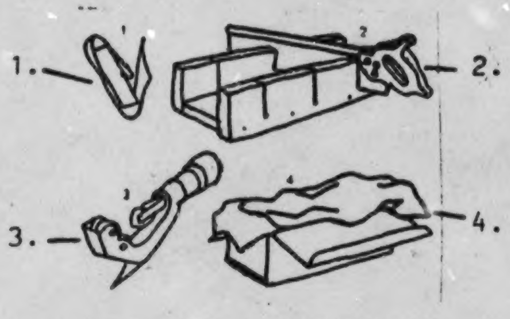
Although rigid plastic pipe is available for use with threaded fittings, the most popular connection system is the "solvent welding" system. You simply coat the end of the pipe with a special plastic cement and push it into the fitting with a twisting motion to spread the cement. The solvent in the cement actually fuses the pipe and fitting together. Be sure the cement is formulated for the type of pipe you are using. Common rigid plastic pipe lengths are 10' and 20'.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	06	1

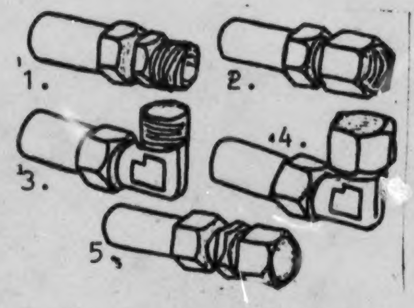
How to Work With Plastic Pipe

Plastic pipe is made from rigid thermoplastic materials that are, in many cases, stronger than metal piping. Although, plastic installations are now accepted in many locations, it is best to check with local building authorities in advance. Some local authorities forbid the use of plastic pipes for water pressure lines.

The most popular plastics for household plumbing are ABS (acrtkibutruke butadiene styrene), PVC (polyvinyl chloride) and CPVC (chlorinated polyvinyl chloride). PVC and ABS are used mainly for DWV (drain, waste and vent) systems, water and gas distribution and as underground electrical conduit. CPVC can be used for distribution of hot and cold water under pressure. All plastic piping systems have fittings made of the same material as the pipe. These are "welded" together with a brushed on solvent. As the cement dries rapidly, work one joint at a time--and always test-fit first. Do not mix two types of plastic in one installation, and when cementing, always read and follow manufacturers's directions.



Tools for working with plastic pipe



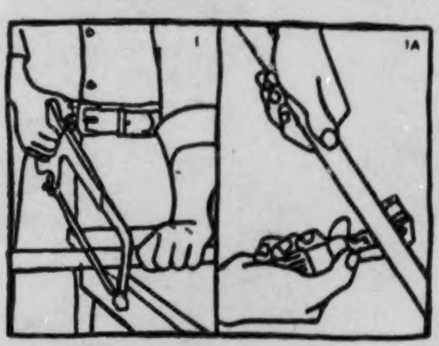
Typical pipe adapters

You probably have most of the equipment you need to work with plastic pipe. Basic tools include: 1) pocketknife 2) miterbox and hacksaw 3) tubing cutter with cutting wheel recommended for plastic pipe and 4) clean rags. Do not use paper products to wipe solvents.

Adapters permit transition from metal pipe and tubing systems to plastic pipe. Numbers 1 through 4 are for use with threaded iron pipe--1 and 3 for connection to female fittings-- 2 and 4 for connection to male fittings. Elbow adapters 3 and 4 are designed for close angle connections and help where space is tight, as is the case with in-the-wall plumbing. The copper tubing adapter 5 is non-threaded.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	06	1

1. 1a

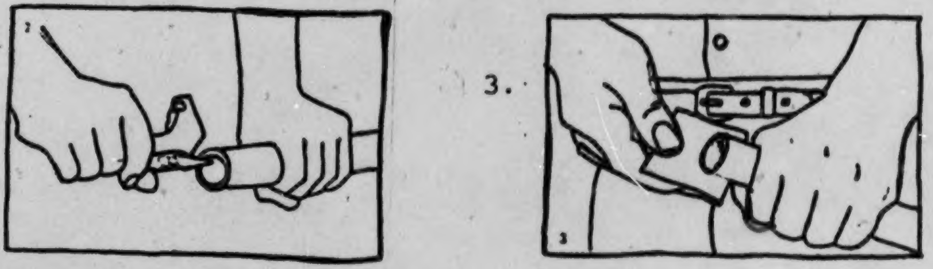


Cutting plastic pipe

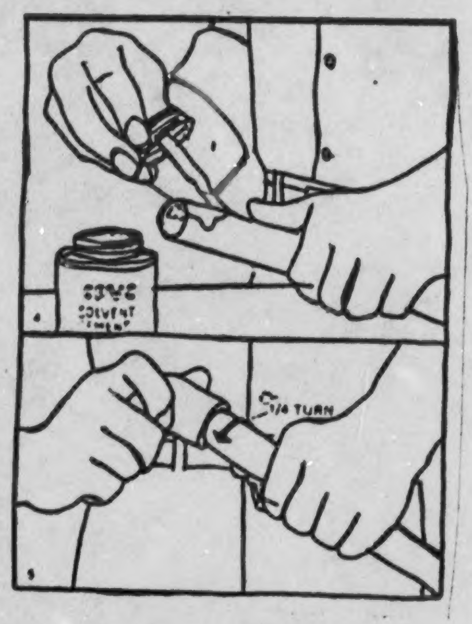
After measuring the length (or run) of pipe needed, cut pipe to proper length, allowing for the distance it goes into fittings. Although, miterbox, hacksaw or tubing cutting are neatest, pipe can also be cut freehand with the hacksaw (Fig. 1), if the hand and eye are steady. The tubing cutter is rotated around (Fig. 1a) the pipe and tightened after every few revolutions until the cut has been completed.

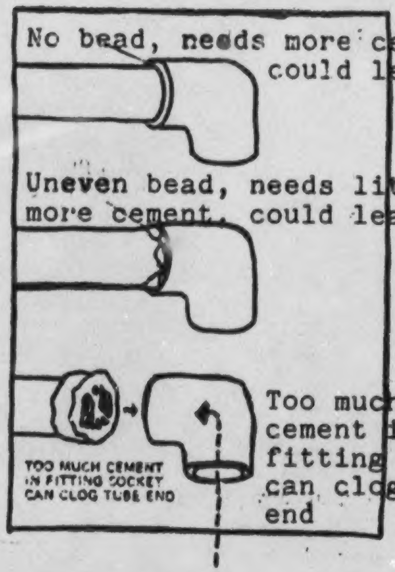
Burrs or ridges from cutting must be removed with knife or tubing reamer (on cutter) so that the ends are smooth inside and out. Next, check the fit. Pipe should enter the fitting socket, but fitting should not fall off when pipe is pointed downward. Next, remove surface gloss from both pipe end and inside of socket with either fine sandpaper or a cleaning solvent made specifically for the type of plastic pipe used.

2. 3.



Deburring the pipe





No bead, needs more cement, could leak

Uneven bead, needs little more cement, could leak

Too much cement in fitting socket can clog tube end

Check in here

Applying solvent cement

Using a narrow brush -- width equal to ½ pipe diameter -- apply thin coat of cement on pipe end. Dip the brush again and apply a thin coat to the socket. Dip once more and recoat the pipe end. Push pipe and fitting together and give joint a quarter turn to spread cement evenly; adjust for proper angle immediately. Hold together for at least 15 seconds then wipe off excess cement.

Three cementing faults are depicted above. Wait an hour--overnight is better--before filling system with water. Check new work for leaks immediately.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	06	1

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "yes" response.

	YES	NO
1. Is the proper amount of cement used?................	____	____
2. Is pipe given ½ turn to insure seal?................	____	____
3. Is pipe cut without splintering?....................	____	____
4. Is the end of pipe cleaned before cementing?........	____	____
5. Is surface gloss removed with solvent?..............	____	____
6. Is proper brush used?...............................	____	____
7. Is an even bead of cement left on finished job?......	____	____
8. Does connection pass air test to 40 P.S.I?..........	____	____
9. Does connection pass water test under water and pressure?..	____	____

If you received a "no" response for any item go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	06	1

PERFORMANCE TEST FOR TASK NO. D-06

RVTC

IN-9723-D-06

TASK: Fabricate a P.V.C. Joint

STUDENT'S NAME ______________________ DATE ______________________

DIRECTIONS TO STUDENT: You will be assigned materials. You are required to fabricate a P.V.C. joint. Your instructor will evaluate your performance using the items listed below.

DIRECTIONS TO EVALUATOR: Evaluate the student's finished work to determine if steps were performed correctly by using the checklist below. Pay close attention to the critical items.

CRITICAL ITEMS *	ITEMS TO BE EVALUATED: (For Mastery 100% of items- including all critical items, must have "Yes" responses).	YES	NO
*1.	Used proper amount of cement?..................		
*2.	Gave pipe ¼ turn to insure seal?..................		
*3.	Cut pipe without splintering?..................		
*4.	Cleaned end of pipe before cementing?..................		
*5.	Removed surface gloss with solvent?..................		
*6.	Used proper brush?..................		
*7.	Left even bead of cement on finished job?..................		
*8.	Connection passed air test to 40 P.S.I?..................		
*9.	Connection passed water test under water and pressure?..................		

☐ MASTERY

Score______ ☐ NON-MASTERY ______________________

EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	# ITEMS	80 %	90 %
IN	9723	D	06		9		

IN-9723-F-01

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VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING and PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Install a Tank Type Water Closet

DUTY: Trimming Out Plumbing

PURPOSE:

Installing the water closet, commonly known as a toilet, is one of the plumber's primary jobs. It is important that the water closet be installed properly to avoid health hazards and accidents. This Learning Guide is designed to show you how to install a water closet properly.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	F	01	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: tools, materials and a water closet,

YOU WILL: install a water closet.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on pages 13-14.

ENABLING OBJECTIVES:

1. Remove water closet.
2. Replace floor flange.
3. Reset a water closet.

DEPT.	PROG.	DUTY	TASK
IND	9723	F	01

ENABLING OBJECTIVE NO. 1

RVTC

Remove water closet.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify tools needed to remove and reset a water closet.	1. Instruction Sheet enclosed, Tools
2. Read Resource No. 2 to identify the steps in removing a floor mounted water closet.	2. a. Instruction Sheet enclosed, Water Closet Removal b. Text: Home Guide to Plumbing, Heating and Air-Conditioning, pages 68-78. c. Text: Plumbing, Installation and Design, pages 201-209.
3. Evaluate your knowledge by completing the Self-Check. Have instructor check your work.	3. a. Self-Check enclosed. b. Instructor
4. Practice removing a floor mounted water closet using Resource No. 2.	4. a. Water closet b. Tools
5. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	F	01	1

INSTRUCTION SHEET **RVTC**

PAGE 1 OF 1

Tools

Listed below are the tools necessary in the installation of a floor mounted water closet.

1. lead tools
2. hammer
3. cold chisel
4. safety glasses
5. adjustable wrench
6. tongue and groove pliers
7. lead ladle
8. lead fernous
9. striker
10. lead oakum
11. sponge
12. washer
13. wax seal

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	F	01	1

INSTRUCTION SHEET **RVTC**

PAGE 1 OF 1

Water Closet Removal

Step 1-- Shut off water by shutting off the curb box or shutting it off under the tank of the water closet using a shut off valve on the bottom left.

Step 2--Drain water from tank and bowl by flushing the tank and sponging out what is left in the bowl.

Step 3--Disconnect stool supply tube, which projects out from the wall to underneath the tank on the left.

CAUTION: Be sure the ball cock assembly does not move, while the supply tube is being taken off because it could break the water tank.

Steps 4 & 5--Remove the caps (sometimes 2 or 4) on stool bolts located on bottom of stool using adjustable wrench. Make sure the washers are removed.

Step 6--Remove water closet from floor flange by grasping it from the bowl under the tank and lifting straight up and setting it on a sturdy surface.

Step 7--Wipe wax ring off the bottom of the bowl (horn) and clean wax from floor flange.

Step 8--Check floor flange to see if it is damaged in any way.

DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	F	01	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below.

1. Where and how do you shut off the water?
2. How do you drain the tank and bowl?
3. What should you be cautious of when disconnecting the stool supply?
4. Where are the stool bolts located?
5. How should you grasp the water closet?
6. What must you be careful of after the water closet has been taken up?

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	F	01	1

ENABLING OBJECTIVE NO. 2

RVTC

Replace floor flange.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the procedure for replacing a floor flange.	1. Instruction Sheet enclosed, Replace Floor Flange
2. Practice replacing a floor flange.	2. a. Water closet b. Floor flange c. Tools
3. Evaluate your knowledge by completing the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 3.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	F	01	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Replace Floor Flange

Step 1--Put on safety glasses.

Step 2--With hammer and cold chisel break away flange.

Step 3--Remove lead and oakum from pipe.

Step 4--Clean up around pipe area.

Step 5--Set new flange over pipe.

Step 6--Place new stool bolts in flange and align with wall.

Step 7--Pack in oakum with yarning iron. (Do Not drop in sewer)

Step 8--Melt and pour lead to proper depth.

Step 9--Caulk lead with inside-outside caulking irons.

CAUTION: Use small wrench. Water closets are easily broken.

Step 10-Flange is now repaired, proceed to reset stool.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	F	01	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was hammer and cold chisel used to break away flange?...	___	___
2. Was lead and oakum removed from pipe?..................	___	___
3. Was area around pipe cleaned?..........................	___	___
4. Was new flange set over pipe?..........................	___	___
5. Were new stool bolts placed in flange and aligned with wall?..	___	___
6. Was it packed in oakum with yarning iron?..............	___	___
7. Was lead melted and poured to proper depth?............	___	___
8. Was lead caulked with inside-outside caulking irons?....	___	___

If you received a "NO" response for any item go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	F	01	2

ENABLING OBJECTIVE NO. 3

RVTC

Reset a water closet.

LEARNING STEPS

1. Read Resource No. 1 to identify the procedure for resetting a water closet.
2. Practice resetting a water closet. Have instructor or advanced student present during first performance.
3. Evaluate your work by completing the Self- Check.
4. When you think you can perform this task, take the Performance Test.

RESOURCES

1. Instruction Sheet enclosed, Resetting a Water Closet
2. a. Water closet
   b. Tools
   c. Instructor
3. Self-Check enclosed.
4. Performance Test for task F-01.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	F	.01	3

INSTRUCTION SHEET **RVTC**

PAGE 1 OF 1

Resetting a Water Closet

Step 1--Remove wax seal from box and unwrap.

Step 2--Place over outlet and on top of floor flange.

Step 3--Grasp water closet by bowl and place over outlet and bolts.

CAUTION: Water closets are easily broken.

Step 4--Level bowl, shim if needed.

Step 5--Place washer, bolt cap holder and nut on stool bolt. Tighten firmly, but carefully.

CAUTION: Use small wrench. Water closets are easily broken.

Step 6--With hacksaw cut off excess bolt.

Step 7--Place cap on bolt, press down firmly.

Step 8--Check supply tube. Replace if defective.

Step 9--Reconnect supply with old or new tube.

Step 10-Turn on water.

Step 11-Check for leaks.

Step 12-Grout in water closet with white grout.

Step 13-Clean up.

DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	F	01	3

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

YES NO

1. Was wax seal removed from box and unwrapped?........... ___ ___
2. Was water closet placed over outlet and on top of floor flange?.. ___ ___
3. Was water closet grasped by bowl and placed over outlet and bolts?.. ___ ___
4. Was bowl leveled and shimmed if needed?................ ___ ___
5. Was washer, bolt cap holder and nut placed on stool? ... ___ ___
6. Was excess bolt cut off with hacksaw?.................. ___ ___
7. Was cap placed on bolt and pressed down firmly?......... ___ ___
8. Was supply tube checked and replace if defective?....... ___ ___
9. Was supply reconnected with old or new tube?........... ___ ___
10. Was water turned on?.................................. ___ ___
11. Was work checked for leaks?............................ ___ ___
12. Was water closet grouted in with white grout?.......... ___ ___

If you received a "NO" response for any item go back and repeat one or mor of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN OBJ.
IN	9723	F	01	3

IN-9723-F-01

PERFORMANCE TEST FOR TASK NO. F-01 RVTC

TASK: Install a Tank Type Water Closet

STUDENT'S NAME ____________________ DATE ____________

DIRECTIONS TO STUDENT: You will install a tank type water closet. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was water shut off at stop?		
2.	Was water drained from tank and bowl?		
3.	Was stool supply disconnected?		
4.	Were stool bolt caps removed?		
5.	Were stool bolt nuts and washers removed?		
6.	Was water closet grasped by bowl and removed from floor flange?		
7.	Was wax seal removed from flange and horn of water closet?		
	Replacement of Defective Flange		
8.	Was flange broken away with a hammer and cold chisel?		
9.	Was lead and oakum removed from pipe?		
10.	Was area around pipe cleaned?		
11.	Was new flange set over pipe?		
12.	Were new stool bolts placed in flange and aligned with wall?		

Score ________

☐ ATTAINED

☐ NOT ATTAINED

EVALUATOR'S SIGNATURE

DEPT	PROG.	DUTY	TASK	ATTEMPT
IN	9723	F	01	

Page 1 of 2

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IN-9723-F-01

PERFORMANCE TEST FOR TASK NO. F-01 CONT.

ITEM NO.	ITEMS TO BE EVALUATED (CONT.):	YES	NO
13.	Was stool packed in oakum with yarning irons?		
14.	Was lead melted and poured to proper depth?		
15.	Was lead caulked with inside-outside caulking irons?		
16.	Was wax seal removed from box and unwrapped?		
17.	Was wax seal placed over outlet and on top of floor flange?		
18.	Was water closet grasped by bowl and placed over outlet and bolts?		
19.	Was bowl leveled and shimmed, if necessary?		
20.	Were washer, bolt cap holder and nut placed on stool and tightened firmly but carefully?		
21.	Was excess bolt cut off with a hacksaw?		
22.	Was cap pressed on bolt and pressed down firmly?		
23.	Was supply tube checked and replaced if necessary?		
24.	Was supply reconnected with old or new tube?		
25.	Was water turned on?		
26.	Was work checked for leaks?		
27.	Was water closet grouted in with white grout?		

PAGE 2 OF 2

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VO-TECH CENTER

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Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Rough-in Water System Using Galvanized Pipe and Fittings

DUTY: Roughing in Plumbing

PURPOSE:

Rough-in plumbing is essential to the installation of water and waste lines. This work must be done according to the Plumbing Code. You must know how to rough-in plumbing and use the proper regulations.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	D	05	

REVISED :				

IN-9723-D-05

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN:	a work order and access to supplies and tools,
YOU WILL:	rough-in a water system using galvanized pipe and fittings.
HOW WELL:	Your performance will be assessed by your instructor using the Performance Test on page 7.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify galvanized pipe and fittings.
2. Identify methods of hanging galvanized pipe.
3. Rough-in water system using galvanized pipe and fittings.

DEPT.	PROG.	DUTY	TASK
IN	9723	D	05

ENABLING OBJECTIVE NO. 1

RVTC

Identify galvanized pipe and fittings.

LEARNING STEPS

1. Read Resource No. 1 to identify galvanized fittings and pipe.
2. Evaluate your knowledge by completing the Self-Check.
3. Go on to Enabling Objective No. 2.

RESOURCES

1. a. Text: Plumbing Installation and Design, pages 33 - 37, 46 -56 and 181 - 198.
   b. Text: Plumbing, Third Edition, pages 50 - 73 and 131 - 176.
   c. Text: Design of Plumbing and Drainage Systems, pages 215, 252, 281, 287 and 328.
2. Text: Plumbing Installation and Design, Student Guide, Chapter 9, pages 41 - 48.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	05	1

ENABLING OBJECTIVE NO. 2

RVTC

Identify methods of hanging galvanized pipe.

LEARNING STEPS

1. Read Resource No. 1 to identify methods of hanging galvanized pipe.
2. Read Resource No. 2 to identify Plumbing Codes.
3. Go on to Enabling Objective No. 3.

RESOURCES

1. Text: Plumbing Installation and Design, pages 112 - 117.
2. Text: Southern Plumbing Code, Chapters IX and XII.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	05	2

ENABLING OBJECTIVE NO. 3

RVTC

Rough-in water system using galvanized pipe and fittings.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1 practice roughing in water system using galvanized pipe and fittings.	1. a. Tools b. Supplies
2. Evaluate your knowledge by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task D-05.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	05	3

SELF-CHECK

Directions

Evaluate your knowledge by answering the items below.

All items should receive a "YES" response.

		YES	NO
1.	Was the main line 3/4" galvanized pipe?		
2.	Was care taken not to supply over one fixture per ½" opening?		
3.	Was water roughed on left side of water closet?		
4.	Were hot and cold water installed without a cross-connection?		
5.	Was water roughed the correct height for lavatory?		
6.	Was cold water roughed on right side of lavatory?		
7.	Was hot water roughed on left side of lavatory?		
8.	Were hot and cold water roughed on the correct side of bath tub?		
9.	Were hot and cold water roughed the correct height for kitchen sink?		
10.	Were all joints threaded correctly and pipe doped?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	05	3

PERFORMANCE TEST FOR TASK NO. D-05

RVTC

IN-9723-D-05

TASK: Rough-in Water System Using Galvanized Pipe and Fittings

STUDENT'S NAME ______________________ DATE ____________

DIRECTIONS TO STUDENT: You will rough-in water system using galvanized pipe and fittings. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED For successful attainment ALL items must receive a "YES" response	YES	NO
1.	Was the main line 3/4" galvanized pipe?......		
2.	Was care taken not to supply over one fixture per ½" opening?......		
3.	Was water roughed on left side of water closet?......		
4.	Were hot and cold water installed without a cross-connection?......		
5.	Was water roughed the correct height for lavatory?......		
6.	Was cold water roughed on right side of lavatory?......		
7.	Was hot water roughed on left side of lavatory?......		
8.	Were hot and cold water roughed on the correct side of bath tub?......		
9.	Were hot and cold water roughed the correct height for kitchen sink?......		
10.	Were all joints threaded correctly and pipe doped?......		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED EVALUATOR'S SIGNATURE ____________

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	D	05	

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Resources

Babbott, Plumbing, McGraw Hill Publishing Co., 1960.

Blenderman, Design of Plumbing and Drainage System, The Industrial Press, 1963.

Ripka, L.V., Plumbing Installation and Design, American Technical Society, 1978.

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IN-9723-D-04

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Rough-in Water System Using Copper Pipe and Fittings

DUTY: Roughing in Plumbing

PURPOSE:

Roughing-in plumbing is essential to the installation of water and waste lines. This work must be done according to the Plumbing Code. You must know how to rough-in plumbing as well as the regulations.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	D	04	

REVISED :

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order and access to supplies,

YOU WILL: rough-in water system using copper pipe and fittings.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 6.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify types of copper pipe and fittings.
2. Rough-in water system using copper pipe and fittings.

DEPT.	PROG.	DUTY	TASK
IN	[illegible]	D	04

ENABLING OBJECTIVE NO. 1

RVTC

Identify types of copper pipe and fittings.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify copper pipe and fittings.	1. a. Text: Plumbing Installation and Design, pages 38 - 42, 102 - 106 and 308 - 311. b. Text: Plumbing II, Section 3, pages 47 - 78. or c. Text: Advanced Plumbing, Section 3, pages 49 - 77. d. Text: Design of Plumbing and Drainage Systems, Chapter 35, pages 252 - 260 and Chapter 39, pages 287 - 294.
2. Read Resource No. 2 to identify plumbing codes.	2. Text: Standard Plumbing Code, Chapters IX and XII.
3. Evaluate your knowledge by completing the Self-Check. Have your instructor check your work.	3. a. Text: Plumbing II, Section 3, Review Questions on all units. or b. Text: Advanced Plumbing, Section 3, Review Questions.
4. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	04	1

ENABLING OBJECTIVE NO. 2

RVTC

Rough-in water system using copper pipe and fittings.

LEARNING STEPS

1. Using Resource No. 1 practice roughing-in a water system using copper pipe and fittings.
2. Evaluate your work by completing the Self-Check.
3. When you think you can perform this task, take the Performance Test.

RESOURCES

1. a. Tools
   b. Supplies
2. Self-Check enclosed.
3. Performance Test for task D-04.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	04	2

SELF-CHECK

RVTC

Directions

Evaluate your work by asnwering the items below.

All items should receive a "YES" response.

		YES	NO
1.	Was the main line 3/4" copper?..........................	____	____
2.	Was care taken not to supply over one fixture per 1/2" opening?..	____	____
3.	Was water roughed on the left side of the water closet?.	____	____
4.	Were hot and cold water installed without a cross connection?..	____	____
5.	Was water roughed the right height for the lavatory?....	____	____
6.	Was cold water roughed on the right side of the lavatory?...	____	____
7.	Was hot water roughed in the left side of the lavatory?.	____	____
8.	Were hot and cold water roughed on the right sides of the bath tub?...	____	____
9.	Were hot and cold water roughed the right height for the kitchen sink?.......................................	____	____
10.	Were all joints cleaned, fluxed and soldered?..........	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	04	2

PERFORMANCE TEST FOR TASK NO. D-04

RVTC

IM-9723-D-04

TASK: Rough-in Water System Using Copper Pipe and Fittings

STUDENT'S NAME ____________________ **DATE** __________

DIRECTIONS TO STUDENT: You will rough-in water system using copper pipe and fittings. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED For successful attainment ALL items must receive a "YES" response	YES	NO
1.	Was the main line 3/4" copper?....................		
2.	Was care taken not to supply over one fixture per 1/2" opening?....................		
3.	Was water roughed on the left side of the water closet?....................		
4.	Were hot and cold water installed without a cross connection?....................		
5.	Was water roughed the right height for the lavatory?....................		
6.	Was cold water roughed on the right side of the lavatory?....................		
7.	Was hot water roughed on the left side of the lavatory?....................		
8.	Were hot and cold water roughed on the right sides of the bath tub?....................		
9.	Were hot and cold water roughed the right height for the kitchen sink?....................		
10.	Were all joints cleaned, fluxed and soldered?....................		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED ____________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	D	04	

Page 1 of 1

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PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Rough in Waste and Vent System Using Cast Iron Pipe

DUTY: Roughing in Plumbing

PURPOSE:

The use of cast iron pipe is somewhat limited at this time, however, a lot is still used on government type work. To be a good plumber you must know how to install a plumbing job using cast iron pipe.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	D	03	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order to rough in waste and vent system using cast iron pipe,

YOU WILL: rough in waste and vent system using cast iron pipe.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 6.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify methods of connecting cast iron pipe.
2. Rough in waste and vent system using cast iron pipe.

DEPT.	PROG.	DUTY	TASK
IN	9723	D	03

ENABLING OBJECTIVE NO. 1

RVTC

Identify methods of connecting cast iron pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify cast iron fittings.	1. a. Text: Plumbing Installation and Design, pages 27 - 33, 119 - 166. b. Text: Plumbing I, pages 42, 45, 48, 51, 54 and 56. c. Text: Plumbing II, pages 36, 38, 42, 48, 82, 89, 101 and 105.
2. Evaluate your knowledge by completing Resource No. 2.	2. a. Text: Plumbing Installation and Design, Student Guide, Chapters 6 and 7. b. Text: Plumbing I, Section 2, Review Questions. c. Text: Plumbing II, Sections 2 and 4, Review Questions.
3. Read Resource No. 3 to identify methods of connecting cast iron pipe.	3. a. Text: Plumbing II, Unit 6, pages 28 - 29. b. Text: Plumbing I, Unit 17, page 41. c. Text: Plumbing Installation and Design, pages 91 - 99.
4. Evaluate your knowledge by completing Resource No. 4.	4. a. Text: Plumbing I, Unit 17, page 40, Review Questions. b. Text: Plumbing II, Unit 6, page 27, Review Questions.
5. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	03	1

ENABLING OBJECTIVE NO. 1

RVTC

Identify methods of connecting cast iron pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify cast iron fittings.	1. a. Text: Plumbing Installation and Design, pages 31 - 32, 119 - 166. b. Text: Plumbing I, pages 42, 45, 48, 51, 54 and 56. c. Text: Plumbing II, pages 36, 38, 42, 48, 82, 89, 101 and 105.
2. Evaluate your knowledge by completing Resource No. 2.	2. a. Text: Plumbing Installation and Design, Student Guide, Chapters 6 and 7. b. Text: Plumbing I, Section 2. c. Text: Plumbing II, Sections 2 and 4.
3. Read Resource No. 3 to identify methods of connecting cast iron pipe.	3. a. Text: Plumbing II, Unit 6, pages 28 - 29. b. Text: Plumbing I, Unit 17, page 41.
4. Evaluate your knowledge by completing Resource No. 4.	4. a. Text: Plumbing Installation and Design, pages 91 - 99. b. Text: Plumbing I, Unit 17, page 40. c. Text: Plumbing Installation and Design, pages 29 - 33. d. Text: Plumbing II, Unit 6, page 27.
5. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	03	1

ENABLING OBJECTIVE NO. 1

RVTC

Rough in waste and vent system using cast iron pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify drainage systems regulations and vents and venting.	1. Text: Standard Plumbing Code, Chapters IV, XIII and XIV.
2. Using Resource No. 2, practice roughing in a waste and vent system using cast iron pipe.	2. Supplies
3. Evaluate your work by completing the Self-Check.	3. Self-Check enclosed.
4. When you think you can perform this task, take the Performance Test.	4. Performance Test for task D-03.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	03	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

		YES	NO
1.	Was 3" cast iron pipe main line used?		
2.	Was 4" cast iron pipe stubbed up for water closet?		
3.	Was 2" cast iron pipe used for tub drain?		
4.	Was 3" cast iron pipe used for vent?		
5.	Were all lead joints properly yarned and poured?		
6.	Were all lead joints properly caulked?		
7.	Was proper procedure and safety used in lighting furnace to heat lead?		
8.	Were gaskets greased for gasket type joints?		
9.	Were all pipes or fittings bottomed on gasket type joints?		
10.	Were all banded joints tightened?		
11.	Did all pipe have proper fall?		
12.	Were all fixtures correct distance from wall and correct height?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	03	2

PERFORMANCE TEST FOR TASK NO. D-03

RVTC

IN-9723-D-03

TASK: Rough in Waste and Vent System Using Cast Iron Pipe

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will rough-in waste and vent system using cast iron pipe. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED For successful attainment ALL items must receive a "YES" response	YES	NO
1.	Was 3" cast iron pipe main line used?		
2.	Was 4" cast iron pipe stubbed up for water closet?		
3.	Was 2" cast iron pipe used for tub drain?		
4.	Was 3" cast iron used for vent?		
5.	Were all lead joints properly yarned and poured?		
6.	Were all lead joints properly caulked?		
7.	Was proper procedure and safety used in lighting furnace to heat lead?		
8.	Were gaskets greased for gasket type joints?		
9.	Were all pipes or fittings bottomed on gasket type joints?		
10.	Were all banded joints tightened?		
11.	Did all pipe have proper fall?		
12.	Were all fixtures correct distance from wall and correct height?		

☐ ATTAINED

☐ NOT ATTAINED

Score ________

____
EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	D	03	

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IN-9723-D-02

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PLUMBING and PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Rough in Waste and Vent System Using PVC Pipe

DUTY: Roughing-In Plumbing

PURPOSE:

All plumbing must be roughed-in following the guidelines in the plumbing code. You must be able to rough-in a building if you are to be a successful plumber.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	D	02	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order and access to supplies,

YOU WILL: rough-in a waste and vent system using PVC pipe.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 7.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify plastic pipe and fittings.
2. Identify plumbing codes.
3. Rough-in waste and vent system using PVC pipe.

DEPT.	PROG.	DUTY	TASK
IN	9723	D	02

ENABLING OBJECTIVE NO. 1

RVTC

Identify plastic pipe and fittings.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify plastic pipe and fittings.	1. Text: Plumbing Installation and Design, pages 42 - 45 and 108 - 111.
2. Read Resource No. 2 to identify waste and vent piping.	2. a. Text: Plumbing Installation and Design, Chapters 6 and 7. b. Text: Plumbing II, Unit 22, page 82 and Unit 28, page 111.
3. Evaluate your knowledge by completing the Self-Check. Have your instructor check your work.	3. a. Text: Plumbing Installation and Design, Student Guide Workbook, Chapters 6 and 7. b. Text: Plumbing II, Review Questions, Unit 22 and 28.
4. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	02	1

ENABLING OBJECTIVE NO. 2

RVTC

Identify plumbing codes.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify general regulations and drainage system regulations.	1. Text: Standard Plumbing Code, Chapter IV and XIII.
2. Read Resource No. 2 to identify regulations for vents and venting.	2. Text: Standard Plumbing Code, Chapter XIV.
3. Go on to Enabling Objective No. 3.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	02	2

ENABLING OBJECTIVE NO. 3

RVTC

Rough-in waste and vent system using PVC pipe.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1 practice roughing-in a waste and vent system using PVC pipe.	1. Supplies
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task D-02.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	02	3

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below. All items should receive a "YES" response.

	YES	NO
1. Was 3" PVC pipe main line used?		
2. Was 4" PVC pipe stubbed up for water closet?		
3. Was 2" PVC pipe used for tub waste?		
4. Was 3" PVC pipe used for vent?		
5. Was 1½" PVC pipe used for lavatory waste arm?		
6. Was water closet roughed 13" from back wall?		
7. Was tub waste roughed 15" from side wall?		
8. Was tub waste roughed 1½" from side wall?		
9. Was space divided equally between the fixtures?		
10. Was lavatory waste roughed 18" above floor?		
11. Was water closet flushed past an unvented fixture?		
12. Were horizontal waste lines falling?		
13. Were horizontal lines checked with a level?		
14. Were horizontal lines falling in the right direction?		
15. Was waste line for tub trapped?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	02	3

PERFORMANCE TEST FOR TASK NO. D-02 RVTC

TASK: Rough-In Waste and Vent System Using PVC Pipe

STUDENT'S NAME ____________________ DATE ____________

DIRECTIONS TO STUDENT: You will rough-in waste and vent system using PVC pipe. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was 3" PVC pipe main line used?		
2.	Was 4" PVC pipe stubbed up for water closet?		
3.	Was 2" PVC pipe used for tub waste?		
4.	Was 3" PVC pipe used for vent?		
5.	Was 1½" PVC pipe used for lavatory waste arm?		
6.	Was water closet roughed 13" from back wall?		
7.	Was tub waste roughed 15" from side wall?		
8.	Was tub waste roughed 1½" from back wall?		
9.	Was space divided equally between the fixtures?		
10.	Was lavatory waste roughed 18" above floor?		
11.	Was water closet flushed past an unvented fixture?		
12.	Were horizontal waste lines falling?		
13.	Were horizontal lines checked with a level?		
14.	Were horizontal lines falling in the right direction?		
15.	Was waste line for tub trapped?		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED

EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	D	02	

Page 1 of 1

RIDGE VO-TECH CENTER 1980

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RIDGE
VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

IN-9723-D-01

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Dig and Backfill a Trench

DUTY: Roughing in Plumbing

PURPOSE:

As a worker in the building trades, the first task you will encounter will be to dig and backfill a trench for water and waste piping to be installed underground. It is necessary that the trench be backfilled according to the manufacturer's specifications.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	D	01	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: the proper tools,

YOU WILL: dig to grade and backfill a trench.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on pages 10-11.

ENABLING OBJECTIVES:

1. Identify proper procedure in the trenching and backfilling operation.
2. Dig a trench and backfill.

DEPT.	PROG.	DUTY	TASK
IN	9723	D	01

ENABLING OBJECTIVE NO. 1

RVTC

Identify proper procedure in the trenching and backfilling operation.

LEARNING STEPS

1. Read Resource #1 to identify the trenching sequence.
2. Read Resource #2 to identify the manufacturer's specs on how to backfill over their product.
3. Complete the Self-Check, then see your instructor.
4. Go on to Enabling Objective #2.

RESOURCES

1. Instruction sheet enclosed, How to trench.
2. Southern Standard Code Book, Appendix A, pp. A1 - A5.
3. Self-Check, enclosed.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	01	1

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

HOW TO TRENCH

We will have to assume that the master plumber has given us the instructions we need, such as where to start, how deep to start and where to go to.

We must be able to trench to grade or fall. We know that water will not run up hill. It will however run down hill. How steep the hill is, is the amount of fall or grade. You have already had the term in your definitions on page 3 - 5 in your code book. Go back at this time and review it.

It is now time to stretch a line from the starting point to the finish along one side of the trench about 12" off center.

At the point the plumber said to start, we will dig a hole parallel to the string and to the depth instructed with the sides square with the bottom. From this beginning we must dig either up or down grade.

Because the lay of the land is sometimes very misleading, we need a two foot level and a straight 2 x 4 about 6' long. The amount of fall we give the trench should be 1/8 of an inch to the foot or 3/4 of an inch in a six foot 2 x 4.

We now proceed to dig six feet of ditch 2" wide and check it for grade using the level and 2 x 4. We continue to repeat this process until you reach the finish point. If you have any questions, ask the instructor.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	01	1

SELF-CHECK

RVTC

Answer the following questions true or false by circling T for true and F for false.

T F 1. 1/8" per foot is plenty of fall.

T F 2. The trench must be wide enough to work in.

T F 3. The side should be square with the bottom.

T F 4. Different material requires different backfill operation.

T F 5. C.I. pipe may have masonry supports.

T F 6. The first layer of backfill on all pipe must be free of rock.

T F 7. The first layer should be compacted by trampling under with the feet.

T F 8. All pipe shall be laid under abutting true to line and grade.

To check your answers, see the instructor.

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	01	1

ENABLING OBJECTIVE NO. 2

RVTC

Dig a trench and backfill.

LEARNING STEPS	RESOURCES
1. Read Resource #1 to identify the tools and instructions needed to proceed.	1. Instruction Sheet enclosed, Tools and Instructions.
2. Now practice trenching and backfilling.	2. a. same as resource # 1. b. equipment. c. assigned area. d. instructor or advanced student. e. pipe.
3. Complete the Self-Check.	3. Self-Check, enclosed.
4. When you think you can trench in a workmanship-like manner, take the Performance Test for mastery.	4. Performance Test D-01.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	D	01	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 2

TOOLS AND INSTRUCTIONS

The list of tools and equipment you will need to proceed with this task are below.

1. Round point shovel
2. Square point shovel
3. Ball of builder's string
4. 2 x 4 six feet long
5. 2 foot level
6. Hammer
7. 2 stakes
8. Ruler
9. 2 -- 10" lengths of 3" pvc pipe.
10. coupling for 3" pvc pipe.

Read the rest of this instruction sheet, then gather together the above list of tools and see your instructor.

You will have to have your tools assembled in the work area before you start to work. Your instructor will tell you where you will dig, how deep to dig and where your trench will go. Then you will:

1. Drive down a stake 12" to the left or right of center.
2. Stretch a string from stake to stake.
3. You will begin your trench from the end where the depth is given.
4. Dig a trench to the finish making sure to follow these simple rules:
    a. the trench should be 24" wide.
    b. Be sure there is 1/8" to the foot for grade.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	01	2

INSTRUCTION SHEET

RVTC

PAGE 2 OF 2

5. When you have finished trenching, couple the pipe together and center it on the line and grade.
6. Bed it in per the manufacturer's specs in the Southern Building Code, appendix A.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	01	2

SELF-CHECK

RVTC

Answer the following questions:

	YES	NO
1. Is trench square?		
2. Was bottom undisturbed?		
3. Was trench wide enough to work in?		
4. Did you backfill in layers?		
5. Was work area backfilled neatly?		

All items should have received a "yes" response. If you received a "no" response for any item go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	D	01	2

PERFORMANCE TEST FOR TASK NO. D-01

RVTC

IN-9723-D-01

TASK: Dig and backfill a trench.

STUDENT'S NAME ______________________ DATE ____________

DIRECTIONS TO STUDENT: Given tools, equipment and material you will dig a trench to line and grade and backfill it to the manufacturer's specs. for PVC plastic pipe.

DIRECTIONS TO EVALUATOR: Give a visual inspection of the trench after it is complete, then check the items below. Pay close attention to the critical items. Observe all of the fill operation using the check list. Check all critical items closely.

CRITICAL ITEMS *	ITEMS TO BE EVALUATED: (For Mastery, 80(%) of items- including all critical items, must have "Yes" responses).	YES	NO
* 1.	Was the ditch straight with the string?		
2.	Was sod removed with care (if applicable)?		
* 3.	Was proper depth attained?		
* 4.	Was the bottom of the ditch undisturbed?		
* 5.	Are sides square?		
* 6.	Was dirt placed at right distance from edge?		
* 7.	Was proper work attitude displayed?		
* 8.	Was worker observant of string?		
9.	Was worker careful getting out of ditch?		
*10.	Did student use 2 x 4 to get grade and check for holes or high spots?		

☐ MASTERY

Score______ ☐ NON-MASTERY ______________________

EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	# ITEMS	80 %	90 %
IN	9723	D	01		18	14	16

PERFORMANCE TEST FOR TASK NO. D-01 CONT'D

IN-9723-D-01

CRITICAL ITEMS *	ITEMS TO BE EVALUATED (CONT'D):	YES	NO
*11.	Was pipe supported uniformly throughout using treated timber, concrete pads, sand or select backfill and properly tamped where trenching conditions were difficult?........	....	....
*12.	Was pipe bedded in select backfill 1/4 to 1/3 of the pipe diameter?........	....	....
*13.	Were no bricks used or other supports to bring the pipe to grade?........	....	....
*14.	Was additional select backfill placed by shovel at sides and over top of pipe and tamped?........	....	....
*15.	Was tamping done carefully?........	....	....
*16.	Was clean backfill used?........	....	....
*17.	Was backfill placed 12" over the pipe?........	....	....
*18.	Was trench backfilled completely without damage to the pipe?........	....	....

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7700 State Road 544 N
Winter Haven, Florida 33880

IN-9723-C-10

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Cut Cast Iron Pipe with a Chisel and Hammer

DUTY: Cutting Pipe

PURPOSE:

Most waste and vent systems are made of PVC pipe, however, there is a lot of cast iron used in government work. You will find all the old systems to be cast iron, therefore, it is necessary to know how to cut the cast iron with a hammer and chisel if you should not have a snap cutter.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	C	10	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: access to tools and pipe,

YOU WILL: cut cast iron pipe with a hammer and chisel.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 6.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Idenitfy methods of cutting cast iron pipe.
2. Cut cast iron pipe with a hammer and chisel.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	10

ENABLING OBJECTIVE NO. 1

RVTC

Identify methods of cutting cast iron pipe.

LEARNING STEPS

1. Read Resource No. 1 to identify methods of cutting cast iron pipe.
2. Evaluate your knowledge by completing the Self-Check.
3. Go on to Enabling Objective No. 2.

RESOURCES

1. a. Text: Do It Yourself Plumbing, page 69.
   b. Text: Basic Plumbing, Units 18 and 19 pages 77 and 81 - 84.
   c. Text: Plumbers and Pipefitters Library, pages 108 - 111.
2. Text: Basic Plumbing, Review Questions, pages 78 and 85.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	10	1

ENABLING OBJECTIVE NO. 2

RVTC

Cut cast iron pipe with a hammer and chisel.

LEARNING STEPS

1. Using Resource No. 1 practice cutting cast iron pipe with a hammer and cold chisel.
2. Evaluate your work by completing the Self-Check.
3. When you think you can perform this test, take the Performance Test.

RESOURCES

1. a. Pipe
   b. Tools
2. Self-Check enclosed.
3. Performance Test for task C-10.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	10	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.
All items should receive a "YES" response.

	YES	NO
1. Were safety glasses worn?............................	____	____
2. Was the size pipe used as indicated by the instructor?.	____	____
3. Was pipe measured and marked with chaulk?.............	____	____
4. Was pipe cut on chaulk line?..........................	____	____
5. Was a dull chisel used?...............................	____	____
6. Was a machine hammer used?............................	____	____
7. Was pipe cut evenly without shattering?...............	____	____
8. Was pipe cut to the length indicated by instructor?....	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	10	2

PERFORMANCE TEST FOR TASK NO. C-10

RVTC

IN-9723-C-10

TASK: Cut Cast Iron Pipe with a Chisel and Hammer

STUDENT'S NAME ____________________ DATE ____________

DIRECTIONS TO STUDENT: You will cut cast iron pipe with a cold chisel and hammer.. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED For successful attainment ALL items must receive a "YES" response	YES	NO
1.	Were safety glasses worn?..........		
2.	Was the size pipe used as indicated by the instructor?..........		
3.	Was pipe measured and marked with chaulk?..........		
4.	Was pipe cut on chaulk line?..........		
5.	Was a dull chisel used?..........		
6.	Was a machine hammer used?..........		
7.	Was pipe cut evenly without shattering?..........		
8.	Was pipe cut to the length indicated by instructor?..........		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED ____________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	C	10		Page 1 of 1

IN-9723-C-09

RIDGE VOTECH CENTER

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P.O. BOX 1537
HAINES CITY, FLORIDA

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Cut Cast Iron Pipe With a Snap Type Chain Cutter

DUTY: Cutting Pipe

PURPOSE:

There are several methods of cutting cast iron pipe, one of which is with a snap type chain cutter. This task will tell you how to use the snap type chain cutter.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	C	09	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order and access to tools and supplies,

YOU WILL: cut cast iron pipe with a snap type chain cutter.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 10.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify steps in cutting cast iron pipe with a chain type cutter.
2. Cut cast iron pipe with a chain cutter.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	09

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in cutting cast iron pipe with a chain type cutter.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify steps in cutting cast iron pipe with a chain cutter.	1. a. Text: Plumbers and Pipefitters Library, pages 41 - 42. b. Text: Plumbing Installation and Design, pages 57 - 58.
2. Evaluate your knowledge by completing the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	09	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by filling in the items below on a separate sheet of paper.

1. What are the types of chain cutters?
2. The ___________ cutter is used to cut larger sizes of soil pipe.
3. The ___________ will cut pipe up to 6".
4. The ___________ is a better choice for no-hub soil pipe.
5. The ___________ is quicker.
6. The ___________ is best in close quarters.

a. hammer
b. rule
c. ratchet-type
d. hacksaw
e. chisel
f. screwdriver
g. hydraulic-type
h. pliers
i. wrench
j. chain
k. squeeze-type

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	09	I

SELF-CHECK

RVTC

Answer Key

1. c, g and k
2. g
3. c
4. k
5. k
6. c

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	09	1

ENABLING OBJECTIVE NO. 2

RVTC

Cut cast iron pipe with a chain cutter.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1, practice cutting cast iron pipe with a chain cutter.	1. Instruction Sheet enclosed, Cut Cast Iron Pipe With a Chain Cutter
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task C-09.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	09	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 2

Cut Cast Iron Pipe With a Chain Cutter

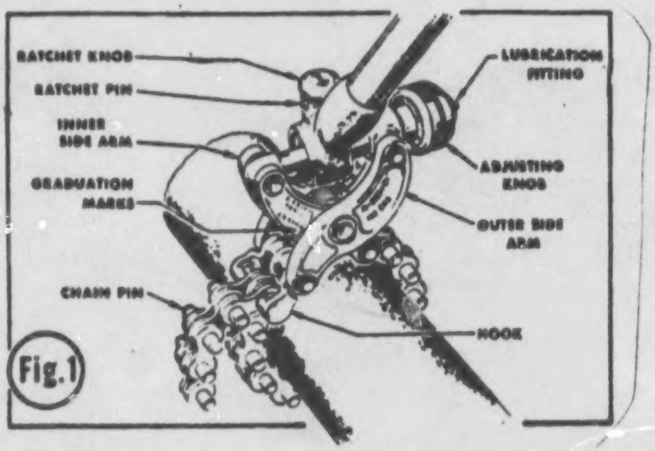
RATCHET KNOB
RATCHET PIN
INNER SIDE ARM
GRADUATION MARKS
CHAIN PIN
LUBRICATION FITTING
ADJUSTING KNOB
OUTER SIDE ARM
HOOK

Fig.1

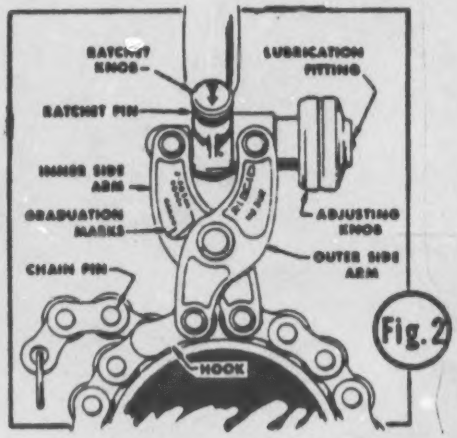
RATCHET KNOB
RATCHET PIN
INNER SIDE ARM
GRADUATION MARKS
CHAIN PIN
LUBRICATION FITTING
ADJUSTING KNOB
OUTER SIDE ARM
HOOK

Fig.2

Important

If ratcheting action stops before pipe is severed, you have jammed the cutter. DO NOT force the handle or Adjusting Knob, simply lift and turn Ratchet Knob so that arrow points AWAY from red handle (See Figure 2). Use a pumping action in direction indicated by arrow to release the chain - Reset Cutter using proper Chain Pin in Hook.

To Set Cutter

1. Lift and turn Ratchet Knob to neutral position (Pin not in groove).
2. Turn Adjusting Knob until the edge of the Outer Side Arm lines up with the mark for the size pipe to be cut. The graduation marks are on the Inner Side Arm.
3. When working conditions permit, place cutter on pipe with Adjusting Knob to the right, while stradling the long end of the pipe.

To Adjust Chain

4. After cutter is properly set, wrap chain around pipe snugly. Set proper Chain Pin into Hooks. Turn Adjusting Knob counterclockwise until chain is tight.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	09	2

INSTRUCTION SHEET

RVTC

PAGE 2 OF 2

5. Turn Ratchet Knob so that arrow points to red handle. (See Figure 1). Chain must be properly set to assure ample travel for cutting action.

To Cut Pipe

6. Use ratcheting motion in direction indicated by arrow on Ratchet Knob, until pipe is severed.

To Lubricate Cutter

1. Lift and turn Ratchet Knob to neutral position (See Step 1).
2. Turn Adjusting Knob clockwise until Side Arms are fully closed.
3. Lubricate fitting in Adjusting Knob. Use a good grade of cup grease. Lubricate until grease appears at the seals.
4. Occasional application of oil to pins and cutting wheels will assure continued freedom of action.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	09	2

SELF-CHECK

R.V.T.C

Directions

Evaluate your work by completing the items below.

All items should receive a "YES" response.

	YES	NO
1. Was cutter set properly?		
2. Was cutter in neutral position?		
3. Was outer Side Arm lined up with mark for the size of pipe to be cut?		
4. Was chain wrapped around pipe snugly?		
5. Was chain pin set into hook?		
6. Was ratched motion used to cut pipe?		
7. Was cutter lubricated?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	09	2

PERFORMANCE TEST FOR TASK NO. C-09 RVTC

IN-9723-C-09

TASK: Cut Cast Iron Pipe With a Snap Type Chain Cutter

STUDENT'S NAME ____________________ DATE __________

DIRECTIONS TO STUDENT: You will cut cast iron pipe with a chain cutter. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was cutter set properly?		
2.	Was cutter in neutral position?		
3.	Was outer Side Arm lined up with mark for the size of pipe to be cut?		
4.	Was chain wrapped around pipe snugly?		
5.	Was chain pin set into hook?		
6.	Was ratched motion used to cut pipe?		
7.	Was cutter lubricated?		

☐ ATTAINED

☐ NOT ATTAINED

Score ______

EVALUATOR'S SIGNATURE ____________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	C	09		Page 1 of 1

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IN-9723-C-08

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P. O. BOX 1537
HAINES CITY, FLORIDA

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK:	Replace a Section of Galvanized Water Service Line
DUTY:	Cutting Pipe

PURPOSE:

Most water service lines are galvanized. As an apprentice plumber, you must be able to replace a section of galvanized water service line.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	C	08	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order and access to tools and supplies,

YOU WILL: replace a section of galvanized water service line.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify steps in replacing a section of galvanized water service line.
2. Replace a section of galvanized water service line.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	08

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in replacing a section of galvanized water service line.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify steps in replacing a section of galvanized water service line.	1. Instruction Sheet enclosed, Replace a Section of Galvanized Water Service Line
2. Evaluate your knowledge by completing the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	08	1

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Replace a Section of Galvanized Water Service Line

1. Locate and identify the leak.
2. Locate water meter or shut-off valves.
3. Turn off water.
4. Cut pipe at desired location.
5. Disconnect pipe to be replaced.
6. Assemble nipple and half union. Connect fittings in supply line.
7. Measure, cut and thread replacement pipe, allowing for fittings.
8. Connect unions.
9. Turn on water supply and check for leaks.

DEPT	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	08	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. The first step in replacing a section of galvanized water service line is to locate the leak.
2. When checking for a water closet leak, turn the water off at the lavatory.
3. Pipe should be cut a desired locations with a hacksaw.
4. If a fitting is damaged it should be replaced.
5. The water service line will have to be replaced with a union in the line.
6. Turn water on and check for leaks, repair any you find.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	08	1

SELF-CHECK

RVTC

Answer Key

1. T
2. F
3. T
4. T
5. T
6. T

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	08	1

ENABLING OBJECTIVE NO. 2

RVTC

Replace a section of galvanized water service line.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1, practice replacing a section of galvanized water service line.	1. Tools
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task C-08.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	08	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was the water turned off?		
2. Was the leak located?		
3. Was the leak repaired?		
4. Was pipe measured and marked?		
5. Were fittings checked for damage?		
6. Was pipe cut square?		
7. Was the correct union selected for installation?		
8. Was water turned on to water check your work?		
9. Were all leaks repaired?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	08	2

PERFORMANCE TEST FOR TASK NO. C-08 | RVTC

IN*9723-C-08

TASK: Repair a Section of Galvanized Water Service Line

STUDENT'S NAME ____________________ DATE ____________

DIRECTIONS TO STUDENT: You will replace a section of galvanized water service line. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was water turned off?		
2.	Was leak located?		
3.	Was pipe cut square?		
4.	Were fittings checked for damage?		
5.	Was pipe to be replaced screwed from fitting?		
6.	Was replacement pipe measured and marked?		
7.	Was union put back in line?		
8.	Was line water checked?		
9.	Were leaks repaired?		
10.	Was area cleaned?		
11.	Were tools put away?		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED EVALUATOR'S SIGNATURE ____________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	C	08		Page 1 of 1

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VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

IN-9723-C-07

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Cut and Thread Galvanized Pipe

DUTY: Cutting Pipe

PURPOSE:

Galvanized pipe is used in water service, sprinkler systems and water systems. You must be able to cut and thread galvanized pipe in order to do this type of work.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	C	07	

REVISED:

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order and access to tool room and supplies,

YOU WILL: cut and thread galvanized pipe.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 10.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify procedure for cutting and threading galvanized pipe.
2. Cut and thread galvanized pipe.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	07

ENABLING OBJECTIVE NO. 1

RVTC

Identify procedure for cutting and threading galvanized pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the procedure for cutting and reaming galvanized pipe.	1. Text: Plumbing Installation and Design, pages 61 - 69.
2. Evaluate your knowledge by completing Resource No. 2.	2. a. Text: Plumbing Installation and Design, Student Guide, questions 5 - 17, page 18. b. Answer Key
3. Read Resource No. 3 to identify the procedure for threading galvanized pipe.	3. a. Text: Plumbers and Pipefitters Library, pages 137 - 147. b. Text: Plumbing I, Unit 2, page 6 and Unit 3, page 8.
4. Evaluate your knowledge by completing Resource No. 4.	4. a. Text: Plumbing I, pages 7 - 9. b. Answer Key enclosed.
5. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	07	1

SELF-CHECK

RVTC

Answer Key

Plumbing Installation and Design

5. T
6. F
7. T
8. T
9. T
10. F
11. T
12. T
13. T
14. T
15. F
16. T
17. T

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	C	07	1

SELF-CHECK

RVTC

Answer Key

Plumbing I, Unit 2

1. American Standard pipe thread
2. V-shaped: 60°
3. 1/32
4. make a sketch to describe taper
5. sharpness at top and bottom
6. the first threads are starting threads and are not intended to seal the pipe and fitting.
7. the taper of the thread
8. leak
9. 1/8" pipe
10. eighteen (18)
11. 1", 1¼", 1½", 2"
12. friction which may ruin the dies
13. the thread will be cut too deep
14. shallow
15. shallow thread (question 14) will not screw into fitting: Deep thread (question 13) will be loose

Plumbing I, Unit 3

1. dull dies
2. 15° - 20°
3. slanted cutting edge
4. lead angle
5. starting threads allow sitting to be started on pipe without much effort
6. to prevent chips from packing and spoiling the threads
7. to reduce the heat caused by friction
8. letter and number on the dies are the same
9. 25°
10. #1 lard oil
11. four (4)
12. standard length

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	07	1

SELF-CHECK

RVTC

13. causes less friction when cutting and will not tear threads when backing off

14. chips will prevent the dies from being in perfect alignment

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	07	1

ENABLING OBJECTIVE NO. 2

RVTC

Cut and thread galvanized pipe.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1, practice cutting and threading galvanized pipe.	1. a. Instructor or advanced student b. Instruction Sheet enclosed, Cut and Thread Galvanized Pipe
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task C-07.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	07	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Cut and Thread Galvanized Pipe

1. Secure pipe in vise, leaving approximately six inches of the end to be cut protruding from the vise.
2. Measure and mark length to be cut.
3. Place pipe cutting wheel on mark to be cut.
4. Tighten cutting wheel on pipe.
5. Make one complete revolution with pipe cutter.
6. Tighten cutting wheel, making ¼" turn with adjustment handle.
7. Continue to revolve and tighten cutting wheel until cut is completed.
8. Ream cut ends to remove burrs.
9. Place round guide end of pipe diestock on pipe end to be threaded.
10. Press dies against pipe end with heel of hand. Hold hand against dies while taking short, clockwise strokes to begin thread cutting operation.
11. Continue cutting threads until appropriate number of threads project from outside edge of dies. Keep diestock oiled during threading procedure.
12. Reverse threader, and remove dies from threaded end of pipe.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	07	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

		YES	NO
1.	Was pipe secured in vise?	____	____
2.	Was pipe measured and marked?	____	____
3.	Was cutting wheel placed on mark?	____	____
4.	Was cutting wheel held on mark while being tightened?	____	____
5.	Was cutter turned ¼" with each revolution?	____	____
6.	Was pipe end reamed?	____	____
7.	Was diestock guide placed on pipe?	____	____
8.	Was diestock turned in clockwise motion?	____	____
9.	Was diestock oiled continuously?	____	____
10.	Was the correct number of threads cut on pipe?	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	C	07	2

PERFORMANCE TEST FOR TASK NO. C-07 RVTC

IN-9723-C-07

TASK: Cut and Thread Galvanized Pipe

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will cut and thread galvanized pipe. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was pipe secured in vise?		
2.	Was pipe measured and marked?		
3.	Was cutting wheel placed on mark?		
4.	Was cutting wheel held on mark while being tightened?		
5.	Was cutter turned ¼" with each revolution?		
6.	Was pipe end reamed?		
7.	Was diestock guide placed on pipe?		
8.	Was diestock turned in clockwise motion?		
9.	Was diestock oiled continuously?		
10.	Was the correct number of threads cut on pipe?		

Score ____ ____

☐ ATTAINED

☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ______________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	C	07		Page 1 of 1

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7700 State Road 544 N
Winter Haven, Florida 33880

IN-9723-C-06

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Join Copper Pipe to PVC Pipe Using Sweat Method

DUTY: Cutting Pipe

PURPOSE:

Since PVC pipe has a very low melting point you must handle it carefully. Copper pipe and PVC pipe are joined by using the sweat method.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	C	06	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: ,a work order and access to tools and supplies,

YOU WILL: join copper pipe to PVC pipe using the sweat method.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify steps to join copper tubing to PVC pipe.
2. Join copper tubing to PVC pipe using sweet method.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	06

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps to join copper tubing to PVC pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in joining copper tubing to PVC pipe.	1. Instruction Sheet enclosed, Joining Copper Tubing to PVC Pipe
2. Evaluate your knowledge by completing the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	06	1

ENABLING OBJECTIVE NO. 2

RVTC

Join copper tubing to PVC pipe using sweat method.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1, practice joining copper tubing to PVC pipe using sweat method.	1. Tools
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task C-06.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	06	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Joining Copper Tubing to PVC Pipe Using Sweat Method

1. Check ends of copper tubing and PVC pipe to be sure they are cut square and reamed.
2. Clean copper pipe end and female adapter with emery cloth.
3. Apply flux or paste to copper pipe end and female adapter.
4. Insert copper pipe into adapter and twist slightly.
5. Light torch, adjust to blue flame, and heat areas of copper overlap until flux or paste bubbles.
6. Apply solder and allow to cool.
7. Remove excess solder with cloth.
8. Clean plastic pipe end and plastic section of female adapter with cleaner. Allow to dry.
9. Apply cement to plastic pipe end and to inside of adapter.
10. Insert cemented pipe end into female adapter, and butt firmly against adapter shoulder.
11. Twist cemented joint ½ turn and allow to dry.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	06	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. Copper tubing does not have to be reamed.
2. The copper end and adapter must be cleaned.
3. Flux is applied to the threads of the adapter.
4. The torch should be adjusted to a yellow flame, when joining copper tubing to PVC pipe.
5. As soon as the solder is applied to the joint you should twist the adapter ½ turn.
6. The plastic pipe and adapter are cleaned with cleaner after solder is removed.
7. Apply cement to both the PVC end and adapter when joining copper and PVC pipe.
8. Twist the cemented joint ½ turn and allow to dry to join the pipes.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	06	1

SELF-CHECK

RVTC

Answer Key

1. F
2. T
3. F
4. F
5. F
6. T
7. T
8. T

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	06	1

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.
All items should receive a "YES" response.

		YES	NO
1.	Were the ends of the copper cut square and reamed?....		
2.	Was the end of the copper cleaned with emery cloth?...		
3.	Was copper adapter cleaned with brush?................		
4.	Was flux applied to both copper and adapter?..........		
5.	Was copper inserted into adapter all the way?.........		
6.	Was flame adjusted to blue?...........................		
7.	Was excess solder removed?............................		
8.	Was plastic pipe cleaned?.............................		
9.	Was cement applied to plastic pipe end and adapter?...		
10.	Was pipe turned ½ turn when plastic pipe was inserted into adapter?.......................................		

If you received a "NO" response for any item, go back and repeat one more of the Learning Steps for this Enalbing Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	06	2

PERFORMANCE TEST FOR TASK NO. C-06 RVTC

IN-9723-C-06

TASK: Join Copper Pipe to PVC Pipe Using Sweat Method

STUDENT'S NAME ____________________ DATE ____________

DIRECTIONS TO STUDENT: You will join copper pipe to PVC using sweat method. You will be evaluated for attainment of this task, based upon the item listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Were the ends of the copper cut suare and reamed?....	....	....
2.	Was the end of the copper cleaned with emery cloth?..	....	....
3.	Was copper adapter cleaned with bruch?..........	....	....
4.	Was flux applied to both copper and adapter?........	....	....
5.	Was copper inserted into adapter all the way?........	....	....
6.	Was flame adjusted to blue?....................	....	....
7.	Was excess solder removed?.....................	....	....
8.	Was plastic pipe cleaned?......................	....	....
9.	Was cement applied to plastic pipe end and adapter?..	....	....
10.	Was pipe turned ½ turn when plastic pipe was inserted into adapter?..............	....	....

Score ________

☐ ATTAINED

☐ NOT ATTAINED

____
EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	C	06		Page 1 of 1

RIDGE VO-TECH CENTER 1980

IN-9723-B-14

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE

VO-TECH CENTER

P. O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Replace Thermostat or Heating Element on an Electric Water Heater

DUTY: Maintaining Plumbing

PURPOSE:

The water heater is no longer a convenience, it has become a necessity in most homes. There are a variety of water heaters to fit the specific needs of the individual. As an apprentice plumber, you must be able to service water heaters.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	14	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order and access to tools and supplies,

YOU WILL: replace thermostat or heating element on an electric water heater.

HOW WELL: You must successfully complete the Written Test.

Your performance will be assessed by your instructor using the Performance Test on page 9.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify electric water heaters.
2. Replace thermostat or heating element on an electric water heater.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	14

ENABLING OBJECTIVE NO. 1

RVTC

Identify electric water heaters.

LEARNING STEPS

1. Read Resource No. 1 to identify various water heaters.
2. Evaluate your knowledge by completing the Self-Check.
3. Go on to Enabling Objective No. 2.

RESOURCES

1. a. Text: Plumbing Installation and Design, pages 237 - 238.
   b. Text: Plumbing, Third Edition, Sections 8-16 and 8-17, pages 198 - 200.
   c. Text: Do It Yourself Plumbing, Chapter 10, pages 158 - 172.
2. Self-Check enclosed.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	14	1

SELF-CHECK

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. The electric water heater storage tank is glass-lined.
2. An electric water heater storage tank has openings on the side for the cold water inlet.
3. An electric water heater storage tank has an opening in the side for the heating element.
4. It is necessary for the water heater to be filled with water before turning on the electricity.
5. "Dry Firing" is when the electricity is turned on before the water heater tank is filled with water.
6. The High Limit Control is a safety precaution for a water heater.
7. The size of a water heater you use in your home is determined by the size of the room where it will be used.
8. To control the temperature of hot water, you open or close the valve on the cold water line to either let in more cold water or restrict it.
9. A pressure and temperature relief valve should be installed on each water heater.
10. All pressure and temperature valves should be installed on the bottom of the water heater.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	14	1

SELF-CHECK

RVTC

Answer Key

1. T
2. F
3. T
4. T
5. T
6. T
7. F
8. F
9. T
10. F

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	14	1

ENABLING OBJECTIVE NO. 2

RVTC

Replace thermostat or heating element on an electric water heater.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to practice replacing a thermostat or heating element on an electric water heater.	1. Instruction Sheet enclosed, Replacing Thermostat or Heating Element
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task B-14.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	14	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Replacing Thermostat or Heating Element

1. Shut off electric current to heater.
2. Shut off water supply.
3. Take front cover off water heater jacket.
4. Drain the water below the level of the element to be replaced.
5. Disconnect electric wires attached to the element.
6. Remove bolts which secure element to the heater tank.
7. Remove old element.
8. Clean old gasket from heater tank opening.
9. Insert new element, replace bolts and tighten.
10. Connect wires to element.
11. Turn water on and fill heater with water.
12. Check for leaks and repair.
13. Turn electric current on.
14. Put front cover on heater jacket.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	14	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was electric current turned off?	___	___
2. Was water supply turned off?	___	___
3. Was water drained below the element before attempts were made to remove element?	___	___
4. Were electric wires disconnected?	___	___
5. Was old element disconnected?	___	___
6. Was old element removed?	___	___
7. Was old gasket removed from tank?	___	___
8. Was new gasket installed with new element?	___	___
9. Was water heater filled?	___	___
10. Was water heater checked for leaks?	___	___

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	14	2

IN-9723-B-14

PERFORMANCE TEST FOR TASK NO. B-14 RVTC

TASK: Replace Thermostat or Heating Element on an Electric Water Heater

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will replace thermostat or heating element on an electric water heater. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was electric current turned off?		
2.	Was water supply turned off?		
3.	Was water drained below the element before attempts were made to remove element?		
4.	Were electric wires disconnected?		
5.	Was old element disconnected?		
6.	Was old element removed?		
7.	Was old gasket removed from tank?		
8.	Was new gasket installed with new element?		
9.	Was water heater filled?		
10.	Was water heater checked for leaks?		

Score ________ ☐ ATTAINED ☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ______________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	14		Page 1 of 1

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WRITTEN TEST FOR TASK NO. B-14

RVTC

TASK: Design a Water System

PAGE 1 OF 2

Directions

Evaluate your knowledge by answering the items below.

1. How would you tighten a valve on a piece of pipe?
2. What damage do steel chips and dirt do to a valve and how may it be prevented?
3. Which kind of valve should be used to reduce friction in a water line to a minimum?
4. What is the purpose of a check valve?
5. What would cause polluted water to be syphoned back into a drinking water system?
6. Where would a plumber look to locate a a water meter?
7. In a certain section of a city the pressure on the water main is 100 lbs. How would you protect the plumbing fixtures?
8. Why do plumbing codes require larger galvanize pipes than copper pipe for the same job?
9. What is the cause and remedy of a flush tank in a home which is wet on the outside?
10. What is the meaning of evaporation?
11. In what way could shallow wells be dangerous?
12. What is atmospheric pressure?
13. What may result from a water logged air chamber?
14. Why is the ground key valve used on water service pipes?
15. How would you determine which end of a valve is to be placed on a pipe?
16. What is the purpose of a stuffing box on a compression valve?
17. The demand of a fixture for water is called _________, which is expressed in gallons per minute (gpm).

DEPT.	PROG.	DUTY	TASK
IN	9723	B	14

WRITTEN TEST FOR TASK NO. B-14

RVTC

TASK: Design a Water System

PAGE 2 OF 2

18. The total demand on a water supply system is based on _________.

19. Water pressure entering the distribution system is measured ________.

20. The difference between the waste pressure at any fixture outlet and the pressure at the water main is known as ________.

21. Pressure loss resulting from height is called ________.

22. The water pressure in the supply pipe of a wide open faucet or outlet is called ________ pressure.

23. Spell out the abbreviations: SC, WC, RV, and LT.

24. The pipe from the branch line to a water heater may not be less than __________.

25. Bathtubs are identified as right hand or left hand according to the location of the tub ________.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	14

WRITTEN TEST FOR TASK NO. B-14

RVTC

TASK: Design a Water System

PAGE 1 OF 2

Answer Key

1. Place the wrench on the end which is being screwed on the pipe.
2. They cut the disc and seats. Blow out the line before installing the valve. Pressure strainers ahead of valve.
3. A gate valve.
4. To prevent backward flow in pipe.
5. A failure in the water system at the time a toilet was clogged. Water may be siphoned back through a flushometer.
6. In the basement where the water enters, or in a meter pit at the curb.
7. By installing a pressure reducing valve.
8. Galvanize pipe carrodes, friction loss will double in 10 years.
9. Failure of the flushometer to shut off -- repair or replace the flushometer.
10. The slow passage of water to air.
11. Seepage from disposal fields and may contaminate shallow wells.
12. The pressure of the air surrounding the earth.
13. Water hammer may result, valves, pipes or tanks may be damaged.
14. It has no washers, so will last indefinetly without repairs.
15. Some valves have arrows on side indicating direction of flow. If no arrow place valve so that the pressure enters under the disc.
16. To prevent leaks around stem.
17. Flow rate.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	14

WRITTEN TEST FOR TASK NO. B-14

RVTC

TASK: Design a Water System

PAGE 2 OF 2

18. An estimate of the extent to which the various fixtues would be used at the same time.

19. When the water is at rest.

20. Pressure loss by friction.

21. Head

22. Flow

23. Sillcork, water closet, relief valve, laundry tub

24. 3/4"

25. Waste openings

DEPT.	PROG.	DUTY	TASK
IN	9723	B	14

DO NOT MARK IN THE BOOK!

Read the following Resources and on a separate sheet of paper complete the Review or Test Your Knowledge. Turn your written answers into your instructor.

RESOURCES:

Plumbing I --
Section 3 - Unit 26, "Cold Water Supply"
Section 3 - Unit 27, "Compression Valves"

Plumbing II --
Section 3 - Unit 15, "Cold Water Supply"
Section 3 - Unit 16, "Water Meters, Curb Boxes and Strainers"
Section 3 - Unit 17, "Pressure Valves and the Bypass"
Section 3 - Unit 18, "House Service Pipe and Basement Water Mains"
Section 3 - Unit 19, "Sources and Solency of Water"
Section 3 - Unit 20, "Water Pressure and Hydrostatic Pressure"
Section 5 - Unit 34, "The British Thermal Unit and the Expansion of Water"
Section 5 - Unit 36, "Automatic Storage Gas Water Heaters"
Section 5 - Unit 37, "Themostats"
Section 5 - Unit 38, "Lever, Spring-type and Diaphragm Relief Valves"
Section 5 - Unit 39, "Electric Water Heaters"
Section 5 - Unit 40, "Summer-Winter Hook-up"
Section 5 - Unit 41, "Indirect Heater and Steam Boiler"
Section 5 - Unit 42, "Solar Heaters"

Modern Plumbing --
Unit 5 - "Valves, Faucets and Meters"
Unit 6 - "Heating and Cooling Water"
Unit 8 - "Designing Plumbing Systems'
Unit 15 - "Water Supply Systems"

Plumbing Installation and Design --
Chapter 9 - "Sizing Water Supply Piping"
Chapter 10 - "Plumbing Fixtures and Appliances"

IN-9723-B-13

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE
VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Thaw a Frozen Pipe

DUTY: Maintaining Plumbing

PURPOSE:

You will seldom be required to thaw a frozen pipe in this area. However, as an apprentice plumber you should be knowledgeable in all tasks.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	13	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order and access to tools and supplies.

YOU WILL: thaw a frozen pipe.

HOW WELL: You must successfully complete the Written **Test.**

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify cold weather precautions.
2. Thaw frozen pipe.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	13

ENABLING OBJECTIVE NO. 1

RVTC

Identify cold weather precautions.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify cold weather precautions.	1. a. Text: Do it Your-Self Plumbing, pages 280 - 283. b. Text: Plumbing, Third Edition, Section 18-18, pages 478 - 479.
2. Evaluate your knowledge by completing the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	13	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. The best way to thaw frozen pipe is to wait until spring.
2. Water freezes at 52° F.
3. Frozen water pipes can be thawed with a light bulb.
4. Plastic water pipes are more likely to burst from freezing than galvanized pipe.
5. Water in traps will freeze and precautions should be taken in the event of a hard freeze.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	13	1

SELF-CHECK

RVTC

Answer Key

1. T
2. F
3. T
4. F
5. T

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	13	1

ENABLING OBJECTIVE NO. 2

RVTC

Thaw frozen pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in thawing frozen water pipe.	1. Instruction Sheet enclosed, Thawing Frozen Pipe
2. Evaluate your knowledge by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can attain this task, take the Written Test.	3. Written Test for tack B-13.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	13	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Thawing Frozen Pipe

1. Locate frozen area of pipe.
2. Open faucet or valve.
3. Light torch and adjust flame.
4. Apply heat in back and forth motion over entire length of frozen area. Take precautions against fire.
5. Continue Step 4 until water runs freely through the line.
6. Remove torch and extinguish flame.
7. Allow water to flow several minutes to avoid refreezing.
8. Close faucet or valve.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	13	2

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. A frozen pipe cannot be thawed with a torch.
2. You should always open a faucet or valve before you attempt to thaw a frozen pipe.
3. When you thaw a frozen pipe with a torch you should always be careful of fire.
4. You should allow the water to flow several minutes after you thaw the pipes to avoid freezing.
5. Frozen water pipes cannot be thawed with electricity.
6. Frozen water pipes cannot be thawed with hot water.
7. Frozen water pipes can be thawed with a hair dryer.
8. Frozen water pipe can be thawed with a heating pad.
9. Frozen water pipes can be thawed with an electric blanket.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	13	2

SELF-CHECK

RVTC

Answer Key

1. F
2. T
3. T
4. T
5. F
6. F
7. T
8. T
9. T

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	B	13	2

WRITTEN TEST FOR TASK NO. B-13

RVTC

TASK: Thaw a Frozen Water Pipe

PAGE 1 OF 1

Directions

The purpose of this test is to determine if you fully understand how to thaw frozen pipe. To successfully complete this test, all items must be answered correctly. For those items missed, see your instructor for a review, additional learning activities or retesting.

The items below are True-False. On the separate Answer Sheet, circle T for True and F for False.

DO NOT MARK ON THIS TEST!

True-False questions

1. The best way to thaw a frozen water pipe is to wait till spring.
2. Plastic pipe is more likely to burst from freezing than any other type of water pipe.
3. Water in traps located in your home are safe from freezing.
4. A frozen water pipe can be thawed with the aid of a plumber's torch.
5. You should never open a faucet or valve when thawing a frozen water pipe.
6. A frozen water pipe can be thawed with an electric welder.
7. A water pipe could not burst in a warm kitchen.
8. Pipes always burst at the spot where the freezing occurs.
9. Always allow the water to flow several minutes after it has been thawed.
10. A plumber's torch is the fastest method of thawing a frozen water pipe.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	13

WRITTEN TEST FOR TASK NO. B-13

RVTC

TASK: Thaw a Frozen Water Pipe

ANSWER SHEET

PAGE 1 OF 1

________________________ Student's Name

________________ Date

NOTE: Record your answers for this test on this answer sheet - NOT on the test itself.

Multiple Choice questions (Put letter of correct answer in the blank to the left of the number of the question.)

____1.
____2.
____3.
____4.
____5.
____6.
____7.
____8.
____9
____10.
____11.
____12.
____13.
____14.
____15.
____16.
____17.
____18.
____19.
____20.
____21.
____22.
____23.
____24.
____25.

True-False questions (Circle T for True and F for False.)

[✓ T] F 1.
T [✓ F] 2.
T [✓ F] 3.
[✓ T] F 4.
T [✓ F] 5.
[✓ T] F 6.
T [✓ F] 7.
T [✓ F] 8.
[✓ T] F 9.
T [✓ F] 10.
T F 11.
T F 12.
T F 13.
T F 14.
T F 15.
T F 16.
T F 17.
T F 18.
T F 19.
T F 20.
T F 21.
T F 22.
T F 23.
T F 24.
T F 25.

Matching questions (On the line to the left of each item in Column A, write in the letter of the item in Column B that best identifies each item.)

____1.
____2.
____3.
____4.
____5.
____6.
____7.
____8.
____9.
____10.
____11.
____12.
____13.
____14.
____15.
____16.
____17.
____18.
____19.
____20.
____21.
____22.
____23.
____24.
____25.

Scorer's signature ________________________ Date ________________

Score ________

DEPT.	PROG.	DUTY	TASK
In	9723	B	13

IN-9723-B-12

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE

VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Repair a Leaking Shower Valve

DUTY: Maintaining Plumbing

PURPOSE:

Almost every home has a shower and at some time the valve will leak. As an apprentice plumber, you must be able to perform this task.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	12	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order and access to tool room and supplies,

YOU WILL: repair a leaking valve.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 8.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify tools and supplies used to repair shower valve.
2. Repair leaking shower valve.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	12

ENABLING OBJECTIVE NO. 1

RVTC

Identify tools and materials used to repair shower valve.

LEARNING STEPS

1. Read Resource No. 1 to identify tools and materials used to repair a shower valve.
2. Evaluate your knowledge by completing the Self-Check.
3. Go on to Enabling Objective No. 2.

RESOURCES

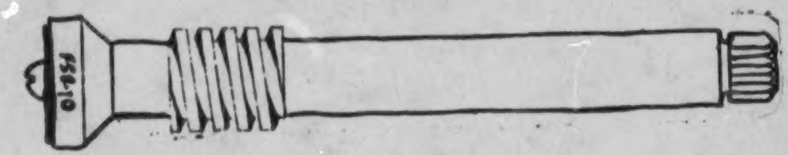
1. Instruction Sheet enclosed, Tools
2. Self-Check enclosed.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	12	1

PAGE 1 OF 1

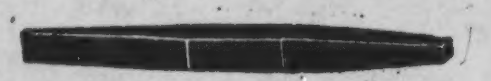
Tools

Shower stem -- Each faucet has a stem on the hot and cold side. The stem is used to control the water.



Faucet seat -- The seat is either built-in or threaded into the body of the faucet. The washer on the stem closes against the seat, closing off the water.

Seat wrench -- Tool used to extract or replace seals.



DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	12	1

ENABLING OBJECTIVE NO. 2

RVTC

Repair leaking shower valve.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in repairing a leaking shower valve.	1. a. Text: Do It Yourself Plumbing, pages 84 - 101. b. Instruction Sheet enclosed, Repair a Leaking Shower Valve
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task B-12.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	12	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Repair a Leaking Shower Valve

1. Cut off water supply.
2. Remove valve stem.
3. Remove and replace valve seat, using valve seat wrench.
4. Remove and replace washer on end of stem.
5. Reassemble stem in body of shower valve.
6. Turn water on and water check.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	12	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was water supply cut-off?	____	____
2. Was stem removed?	____	____
3. Was valve seat removed using valve seat wrench?	____	____
4. Was washer on the stem replaced?	____	____
5. Was stem assembled in the body of the shower valve?	____	____
6. Was water turned on?	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	12	2

PERFORMANCE TEST FOR TASK NO. B-12

RVTC

IN-9723-B-12

TASK: Repair a Leaking Shower Valve

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will repair a leaking shower valve. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was water supply cut-off?		
2.	Was stem removed?		
3.	Was valve seat removed using valve seat wrench?		
4.	Was washer on the stem replaced?		
5.	Was stem assembled in the body of the shower valve?		
6.	Was water turned on?		

Score ________

☐ ATTAINED

☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ______________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	B	12	

Page 1 of 1

RIDGE VO-TECH CENTER 1980

IN-9723-B-11

DRAFT COPY

RIDGE
VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Repair or Replace Waste and Overflow on a Bathtub

DUTY: Maintaining Plumbing

PURPOSE:

The trip lever waste and overflow is a very important part of any bathtub or shower. The lever is used to retain or drain the water from the tub or shower. This Learning Guide will show you how to install and adjust the trip lever waste and overflow.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	B	11	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: tools and equipment,

YOU WILL: install and adjust a trip lever waste and overflow.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 11.

ENABLING OBJECTIVES:

1. Identify parts of a trip lever waste and overflow.
2. Install and adjust a trip lever waste and overflow.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	11

ENABLING OBJECTIVE NO. 1

RVTC

Identify parts of a trip lever waste and overflow.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the parts of a trip lever waste and overflow.	1. a. Text: Modern Plumbing, page 234. b. Text: Plumbing Installation and Design, page 220.
2. Read Resource No. 2 to identify the procedure for installing a trip lever waste and overflow.	2. Instruction Sheet enclosed, Trip Lever Waste and Overflow
3. Complete the Self-Check.	3. Self-Check enclosed
4. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	11	1

INSTRUCTION SHEET

RVTC

PAGE 1 OF 3

Trip Lever Waste and Overflow

"Any Fit" Bath Drain and Overflow Fitting by Price Pfister.

This fitting will fit all popular tubs without cutting tubing. Vertical adjustment: 9½" to 13¼", Horizontal adjustment: 4 5/8" Min. to 5 3/4" Max. Installation can be easily accomplished by one man.

Installation Instructions

NOTE: Overflow plate assembly (D) need not be installed until job is ready to be trimmed.

1. Drain and Overflow Assembly
    1. Assemble unit fingertight, as shown. Position Overflow Washer (1) on Overflow Elbow (A) and rotate to match angle of tub.
    2. Insert Overflow Elbow (A) with attached Screws (2) through Tub Overflow Hole.
    3. Slip Retainer Plate over Screws (2) as shown. Insert Rubber Gasket (3) onto Waste Elbow (B) Flange and align Waste Elbow (B) with Tub Outlet Hole.
2. Waste Plug Assembly
    1. Apply putty on Waste Plug (4) flange and screw into Waste Elbow (B). Attach Strainer (5).
    2. Check that Overflow Draintube is vertical and at right angles to Waste Draintube. Wrench tighten Locknuts (6) and secure Holding Screws (2).
3. To Trim Tub
    1. Place Bucket (C) on inside bottom of tub and screw Eyebolt (7) into Clevis (8) until bottom of Clevis (8) is even with Holding Screws (2). Secure adjustment with Locking Nut (9).
    2. Insert Bucket (C) into Overflow Elbow (A) and secure Overflow Plate (D) with Screws (10).

If necessary, remove Overflow Plate (D) and readjust for seal and lift.

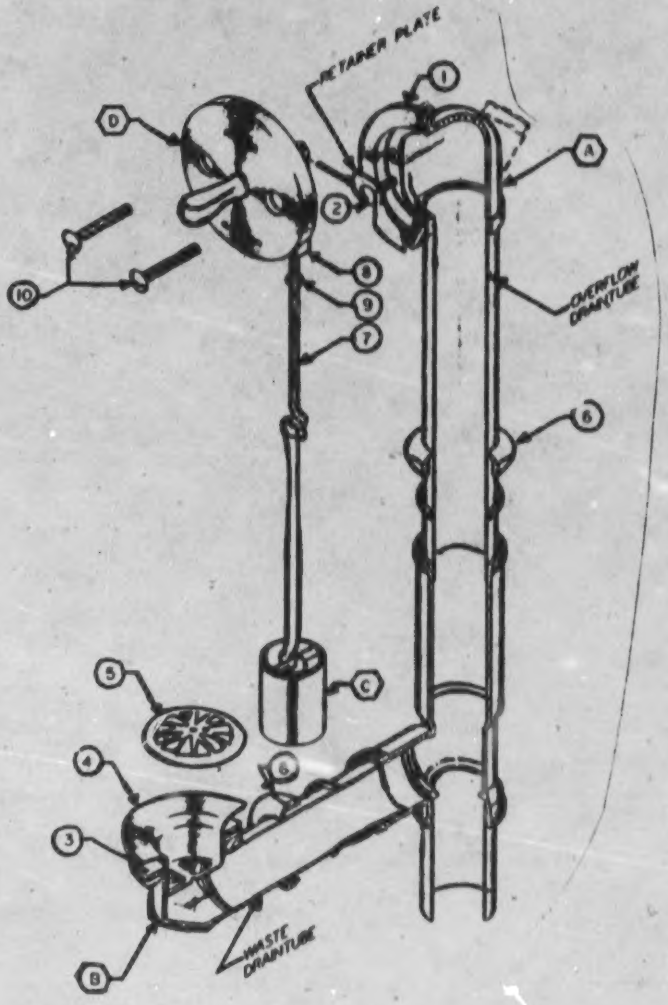
DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	B ,	11	1

INSTRUCTION SHEET

RVTC

PAGE 2 OF 3

Figure 1 Trip Lever Waste and Overflow


RETAINER PLATE
1
D
A
2
8
9
7
10
OVERFLOW DRAINTUBE
6
C
5
4
6
3
B
WASTE DRAINTUBE

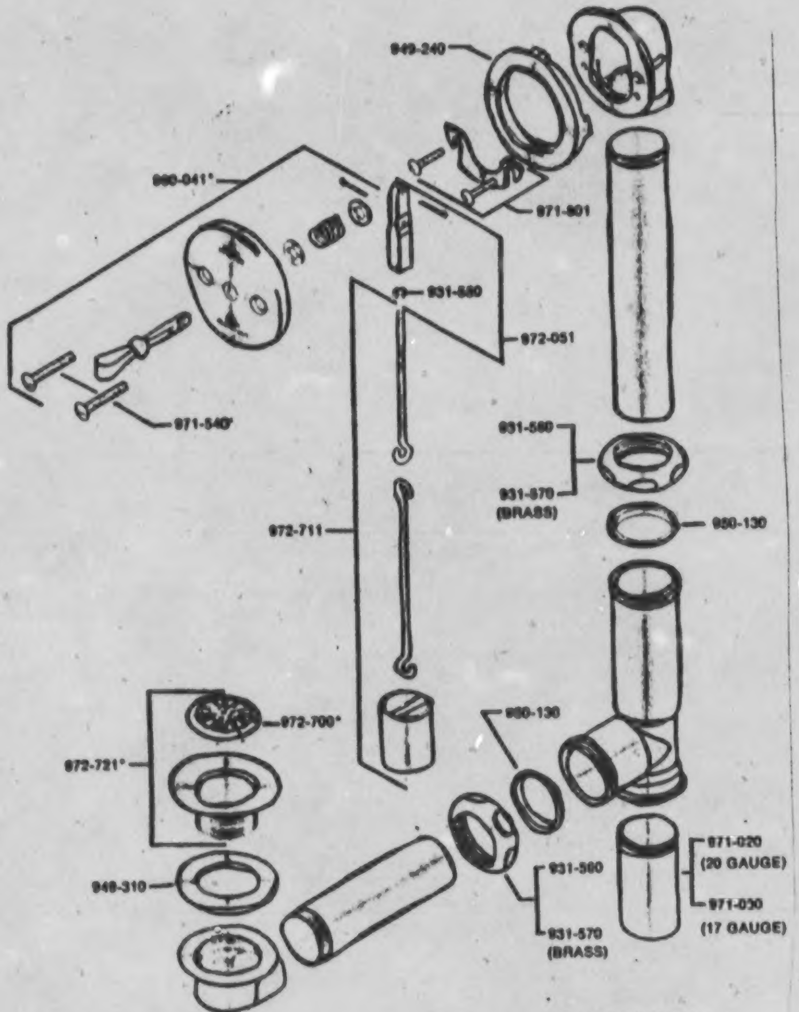
DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	B	11	1

INSTRUCTION SHEET

RVTC

PAGE 3 OF 3

Figure 2 Trip Lever Waste and Overflow


949-240
960-041*
971-801
931-580
972-051
971-540*
931-580
931-570
(BRASS)
950-130
972-711
950-130
972-700*
972-721*
948-310
931-580
931-570
(BRASS)
971-020
(20 GAUGE)
971-030
(17 GAUGE)

*LETTER DESIGNATES FINISH REQUIRED

A – POLISHED CHROME
H – SATIN CHROME
L – ANTIQUE CHROME
N – ANTIQUE BRONZE

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	11	1

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

T F 1. The trip lever must be adjusted to allow the pop-up to control the water flow.

T F 2. The screws that hold the face plate in place also make the overflow water tight.

T F 3. A poorly adjusted trip lever will allow the water to leak slowly from the tub.

T F 4. The shoe of the waste and overflow is installed first.

T F 5. The tail piece has fine threads.

T F 6. It is a good practice to check for leaks with a full tub of water.

T F 7. Slip joint washers are allowed on a waste and overflow.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	11	1

ENABLING OBJECTIVE NO. 2

RVTC

Install and adjust a trip lever waste and overflow.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the procedure for installing and adjusting a trip lever waste and overflow.	1. Instruction Sheet enclosed, Adjust Trip Lever Waste and Overflow
2. Practice installing and adjusting a trip lever waste and overflow.	2. a. Trip lever waste and overflow b. Tools
3. Complete the Self-Check.	3. Self-Check enclosed
4. When you think you know how to perform this task, take the Written Test.	4. Written Test for task B-11.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	11	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Adjust Trip Lever Waste and Overflow

1. Remove the two screws from the cover plate
2. Loosen the two screws holding the retainer plate.
3. Remove retainer plate.
4. Remove cover plate and trip assembly.
5. Remove all foreign matter from bucket.
6. Adjust lift arm to proper depth or height to retain or drain water in tub.
7. Reverse steps 1 through 4 and test.

DEPT.	PROG	DUTY	TASK	EN OBJ.
IN	9723	B	11	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "yes" response.

	YES	NO
1. Was strainer tightened into waste elbow?............	____	____
2. Was tee placed on with threader down?...............	____	____
3. Was tail piece thread doped?........................	____	____
4. Was the overflow gasket behind the cover plate?......	____	____
5. Were all joints checked for leaks?..................	____	____
6. Was gasket inserted between tub and waste?..........	____	____
7. Were all slip joint washers in place?...............	____	____
8. Was bucket adjustment nut tightened?................	____	____
9. Were tail pieces tightened?.........................	____	____
10. Was bucket lubrication applied?....................	____	____
11. Was student careful not to scratch or chip tub?......	____	____

If you received a "no" response for any item go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	11	2

PERFORMANCE TEST FOR TASK NO. B-11

RVTC

IN-9723-B-11

TASK: Install and Adjust a Trip Lever Waste and Overflow

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will be assigned tools, materials and a trip lever waste and overlow. You are required to install and adjust a trip lever waste and overflow. Your instructor will evaluate your performance using the items listed below.

DIRECTIONS TO EVALUATOR: Evaluate the student's finished work to determine if steps were performed correctly by using the checklist below. Pay close attention to the critical items.

CRITICAL ITEMS *	ITEMS TO BE EVALUATED: (For Mastery 100% of items- including all critical items, must have "Yes" responses).	YES	NO
*1.	Was strainer tightened into waste elbow?............	....	....
*2.	Was tee placed on with threader down?............	....	....
*3.	Was tail piece thread doped?............	....	....
*4.	Was the overflow gasket behind the cover plate?......	....	....
*5.	Were all joints checked for leaks?............	....	....
*6.	Was gasket inserted between tub and waste?..........	....	....
*7.	Were all slip joint washers in place?............	....	....
*8.	Was bucket adjustment nut tightened?............	....	....
*9.	Were tail pieces tightened?............	....	....
*10.	Was bucket lubrication applied?............	....	....
*11.	Was student careful not to scratch or chip tub?.....	....	....

☐ MASTERY

Score ______ ☐ NON-MASTERY ______________________

EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	# ITEMS	80 %	90 %
IN	9723	B	11		11		

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PLUMBING AND PIPEFITTING

RIDGE

VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

IN-9723-C-05

A STUDENT LEARNING GUIDE

TASK: Bend Copper Tubing with a Spring Bender

DUTY: Cutting Pipe

PURPOSE:

There are many times when it is necessary to bend copper. One of the best methods is to use a spring bender. You can bend copper in this way and not kink it.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	C	05	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order and access to tools and supplies,

YOU WILL: bend copper tubing with a spring bender.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify tools used in bending copper tubing.
2. Bend copper tubing with a spring bender.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	05

ENABLING OBJECTIVE NO. 1

RVTC

Identify tools used to bend copper tubing.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify tools used to bend copper tubing.	1. Text: Plumbing Installation and Design, page 75.
2. Evaluate your knowledge by completing the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	05	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by selecting the proper word to fill in the statement.

a. 7/8 inch OD
b. torch
c. spring
d. hard
e. hammer
f. smooth
g. 3/8 inch OD
h. kink
i. soft
j. lever

1. Soft copper up to ______ inch OD may be bent with benders.
2. Tubing benders produce a __________ bend in copper.
3. Care must be taken not to _________ the copper.
4. The __________ bender is used on _______ tubing.
5. The __________ type bender is for ______ or ________ tubing.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	05	1

SELF-CHECK

RVTC

Answer Key

1. a
2. f
3. h
4. c,i
5. j,d,i

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	05	1

ENABLING OBJECTIVE NO. 2

RVTC

Bend copper tubing with spring bender.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the procedure for bending copper tubing with a spring bender.	1. Instruction Sheet enclosed, Bend Copper Tubing With a Spring Bender
2. Practice bending copper tubing using spring benders.	2. a. Supplies b. Spring bender
3. Evaluate your knowledge by completing the Self-Check.	3. Self-Check enclosed.
4. When you think you can perform this task, take the Performance Test.	4. Performance Test for task C-05.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	05	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Bend Copper Tubing With a Spring Bender

1. Insert tubing into bender.
2. Clasp spring-enclosed tubing with both hands, thumbs pointing inward one inch apart.
3. Form bend with thumb and hand pressure.
4. Check bend angle with a combination square.
5. Check for crimps in bend.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	05	2

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separte sheet paper.

1. Spring benders are used on soft tubing.
2. Use only one hand to clasp the benders when bending tubing.
3. A bend is formed by your hands.
4. A bend can be made to any angle.
5. Care should be taken not to crimp or kink the tubing.

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	05	2

PERFORMANCE TEST FOR TASK NO. C-05

RVTC

IN-9723-C-05

TASK: Bend Copper Tubing With a Spring Bender

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will bend copper tubing with a spring bender. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Were bender and copper the same size?		
2.	Was soft copper tubing used?		
3.	Was bender clasped with both hands?		
4.	Was bend formed with hands?		
5.	Was square used to check bend?		
6.	Was copper not crimped?		

Score ______

☐ ATTAINED

☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ______________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	C	05		Page 1 of 1

RIDGE VO-TECH CENTER 1980

IN-9723-C-04

RIDGE
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PLUMBING AND PIPEFITTING

RIDGE
VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Join Copper Tubing to Steel and PVC Pipe

DUTY: Cutting Pipe

PURPOSE:

Either copper, steel or PVC pipe are used to rough-in all plumbing. As an apprentice plumber, you must be able to work with these pipes.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	C	04	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order and access to tools and supplies,

YOU WILL: join copper tubing to steel and PVC pipe.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 10.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify steps in joining copper tubing to steel pipe.
2. Identify steps to join copper tubing to PVC pipe.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	04

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps to join copper tubing to steel pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in joining copper tubing to steel pipe.	1. Instruction Sheet enclosed, Joining Copper Tubing to Steel Pipe
2. Using Resource No. 1, practice joining copper tubing to steel pipe.	2. Tools
3. Evaluate your work by completing the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	04	1

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Joining Copper Tubing to Steel Pipe

1. Check copper tubing for squareness and no burrs. Cut and ream, if necessary.
2. Disassemble dielectric union.
3. Clean copper tubing end and inside of female section of copper fitting with emery cloth.
4. Apply flux to cleaned areas of tubing and fittings.
5. Insert tubing end into female section of fitting; twist slightly. Tube end should rest firmly against shoulder of female section.
6. Light touch, adjust to blue flame and heat areas of copper overlap until flux bubbles..
7. Apply solder and allow to cool.
8. Remove excess solder and flux with cloth.
9. Apply pipe sealant to male pipe threads.
10. Attach threaded section of fitting to pipe and tighten.
11. Reassemble fitting ends together, using wrenches in such a manner that stress on copper joint is avoided.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	04	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. The ends of the copper should be checked for squareness.
2. A ground joint union should be used to join copper tubing to steel pipe.
3. It is necessary to clean both the end of the copper and the fitting before you solder.
4. The end of the copper should rest firmly in the back of the fitting being soldered.
5. Adjust the flame on the torch until it is yellow.
6. When soldering copper to steel, apply flux to the male end of steel pipe.
7. Excess solder is removed with a cloth.
8. Reassemble fitting ends together and tighten with wrenches.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	04	1

SELF-CHECK

RVTC

Answer Key

1. T
2. F
3. T
4. T
5. F
6. F
7. T
8. T

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	C	04	1

ENABLING OBJECTIVE NO. 2

RVTC

Identify steps to join copper tubing to PVC pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the procedure for joining copper tubing to PVC pipe.	1. Instruction Sheet enclosed, Joining Copper Tubing to PVC Pipe
2. Using Resource No. 2, practice joining copper tubing to PVC pipe.	2. Tools
3. Evaluate your work by completing the Self-Check.	3. Self-Check enclosed.
4. When you think you can perform this task, take the Performance Test.	4. Performance Test for task C-04.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	04	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Joining Copper Tubing to PVC Pipe

1. Position plastic pipe on a raised flat surface and cut square with hacksaw.
2. Ream plastic pipe end, inside and out, with knife.
3. Clean 1½ to 2 inches of exterior pipe end and inside of female adapter with cleaner.
4. Apply cement to cleaned pipe end.
5. Insert plastic pipe into adapter and butt firmly against adapter shoulder.
6. Twist pipe ½ turn and allow to dry.
7. Square copper tubing end with tubing cutter, and ream with reamer.
8. Slide flare nut on tubing and flare tubing end.
9. Position flared tubing end to adapter and tighten flare nut to adapter.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	04	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was plastic pipe cut with a hacksaw?..................		
2. Was plastic pipe reamed with a knife?.................		
3. Was 1½ inch of exterior pipe end cleaned?.............		
4. Was cement applied to cleaned pipe end?...............		
5. Was plastic pipe inserted into adapter?...............		
6. Was pipe twisted ½ turn?..............................		
7. Was copper pipe reamed with reamer?...................		
8. Was flare nut slid on tubing before flaring?..........		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG	DUTY	TASK	EN. OBJ.
IN	9723	C	04	2

PERFORMANCE TEST FOR TASK NO. C-04 RVTC

IN-9723-C-04

TASK: Join Copper Tubing to Steel and PVC Pipe

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will join copper tubing to steel or PVC pipe. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was copper tubing end checked for squareness and reamed?		
2.	Was dielectric union used to join copper to steel pipe?		
3.	Was flux used on copper?		
4.	Was torch adjusted to blue flame?		
5.	Was joint soldered?		
6.	Was pipe compound applied to steel pipe?		
7.	Was PVC pipe cut square and reamed?		
8.	Was PVC pipe cleaned?		
9.	Was correct amount of current used?		
10.	Was correct size flare nut selected?		
11.	Was flare nut put on copper before flaring?		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED EVALUATOR'S SIGNATURE ________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723*	C	04		Page 1 of 1

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7700 State Road 544 N
Winter Haven, Florida 33880

IN-9723-C-03

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Cut and Flare Copper Tubing

DUTY: Cutting Pipe

PURPOSE:

Copper tubing is used in the installation of new plumbing and in maintenance. Since this pipe is so widely used it is essential that you be able to work with it.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	C	03	

REVISED:

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: copper tubing and access to tools,

YOU WILL: cut and flare copper tubing.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify tools used to cut and flare copper tubing.
2. Cut and flare copper tubing.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	03

ENABLING OBJECTIVE NO. 1

RVTC

Identify tools used to cut and flare copper tubing.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify tools used to cut and flare copper tubing.	1. Text: Plumbing Installation and Design, pages 72 - 75. Text: Plumbing II, pages 3 - 4. Text: Plumbers and Pipefitters Library, pages 39 - 41 and pages 44 - 45.
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	03	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separte sheet of paper.

1. Copper tubing cutters are basically the same as other tubing cutters.
2. The only difference in a copper tubing cutter and a PVC cutter is the size of the handle.
3. Copper tubing cutters have a built-in reamer.
4. Flaring tools are adjustable from size ¼ to 2 inches.
5. The screw portion of a flaring tool is to tighten down and force the copper to flare out into the yoke.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	03	1

SELF-CHECK

RVTC

Answer Key

1. T
2. F
3. T
4. F
5. T

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	03	1

ENABLING OBJECTIVE NO. 2

RVTC

Cut and flare copper tubing.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1, practice cutting and flaring copper tubing.	1. Instruction Sheet enclosed, Cut and Flare Copper
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task C-03.

DEPT.	PROG.	DUTY	TASK	EN.OB

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Cut and Flare Copper

1. Measure and mark tubing length to be cut.
2. Place tubing cutting wheel on mark where tubing is to be cut and slowly tighten roller against tubing.
3. Rotate cutter around circumference of tubing.
4. Tighten cutting wheel and repeat Step 4 as often as needed to complete cut.
5. Ream cut end to remove burrs.
6. Place copper end in flaring tool yoke.
7. Make sure the end of copper tubing is flush with the top surface. of the yoke and clamp firmly.
8. Screw the screw portion of the tool clockwise into the end of the copper tubing.
9. When you have screwed the screw portion all the way down and the flare is made the screw portion will automatically stop.

DEPT	PROG	DUTY	TASK	EN.OBJ

SELF-CHECK

RVTC

Directions

Evaluate you work by answering the items below.
All items should receive a "YES" response.

	YES	NO
1. Was copper tubing cutter obtained?....................	____	____
2. Was the copper tubing measured accurately?...........	____	____
3. Was the cutter wheel placed against the mark to insure cutting the tubing the correct length?..........	____	____
4. Was the cutter rotated all the way around the tubing?	____	____
5. Was the cutter wheel tightened slowly to get a smooth, even cut?....................................	____	____
6. Was the tubing end reamed to remove burrs?...........	____	____
7. Was the tubing placed into the flaring tool according to outlined procedures?............................	____	____
8. Was the tubing cutter closed and clamped firmly?.....	____	____
9. Was the screw portion turned clockwise?..............	____	____
10. Was the screw portion turned all the way down?.......	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT	PROG	UNIT	TASK	[illegible]

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PERFORMANCE TEST FOR TASK NO. C-03 RVTC

IN-9723-C-03

TASK: Cut and Flare Copper Tubing

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will cut and flare copper tubing. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was copper tubing cutter obtained?		
2.	Was the copper tubing measured accurately?		
3.	Was the cutter wheel placed against the mark to insure cutting the tubing the correct length?		
4.	Was the cutter rotated all the way around the tubing?		
5.	Was the cutter wheel tightened slowly to get a smooth even cut?		
6.	Was the tubing end reamed to remove burrs?		
7.	Was the tubing placed into the flaring tool according to outlined procedures?		
8.	Was the tubing cutter closed and clamped firmly?		
9.	Was the screw portion turned clockwise?		
10.	Was the screw portion turned all the way down?		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED ______________________ EVALUATOR'S SIGNATURE

IN	9723	C	03		Page 1 of 1

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IN-9723-C-02

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VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Identify Copper Fittings and Pipe

DUTY: Roughing in Plumbing

PURPOSE:

As an apprentice plumber you will be assisting the journeyman in selecting copper pipe and fittings. You should be able to select the fittings and pipe by sight to insure accurate work and customer satisfaction.

DEPT.	PROG.	DUTY	TASK	[illegible]

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: copper fittings and pipe,

YOU WILL: identify copper fittings and pipe.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 7.

ENABLING OBJECTIVES:

1. Identify copper fittings.
2. Identify copper pipe.

IN	9043	C	02

ENABLING OBJECTIVE NO. 2

RVTC

Identify copper pipe.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the various types of copper pipe.	1. Text: Plumbing Installation and Design, page 38.
2. Using Resource No. 2 identify the procedure for determining the length of copper pipe.	2. a. Hard stick b. Soft coils
3. Using Resource No. 3 identify the procedure for marking copper pipe.	3. a. Stamped code b. Color code
4. Complete the Self-Check.	4. Self-Check enclosed.
5. When you think you can perform this task, take the Performance Test.	5. Performance Test for task C-02.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	02	2

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SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below.

When you think you know all the copper fittings, have another student show you the various fittings, without the board, to see if you can name each fitting. If you miss any of the fittings, go back and refresh your memory.

FITTINGS

1. 1/2" pressure cap
2. 1/2" test cap
3. 1/2" ell
4. 1/2" st. ell
5. 1/2" - 45°
6. 1/2" - st. 45°
7. 1/2" union
8. 1/2" tee
9. 1/2" coupling
10. 1/2" sweat X 1/2" sweat X 1/2" f.i.p. wing tee
11. 1/2" sweat X 1/2" f.i.p. drop eared ell
12. 1/2" sweat X 1/2" m.i.p. ell
13. 1/2" sweat X 1/2" m.i.p. adpt.
14. 1/2" sweat X 1/2" f.i.p. adpt.
15. 1/2" bushing
16. 1/2" reducer
17. 1/2" fitting reducer
18. 6" air chamber
19. 12" air chamber

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	02	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below.

1. Name the types of soft copper.
2. Name the types of hard copper.
3. How are the types identified?

On the line to the left of each item in Column A, write in the letter of the item in Column B that best identifies each item.

	A	B
_____	1. Type K	a. red
_____	2. Type L	b. yellow
_____	3. Type M	c. blue
_____	4. Type DWV	d. black
		e. green

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	02	2

SELF-CHECK

RVTC

Answer Key

1. Type K, Type L

2. Type K, Type L, Type M

3. stamps and color coding

Matching questions

1. e

2. c

3. a

4. b

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	02	2

PERFORMANCE TEST FOR TASK NO. C-02

RVTC

IN-9723-C-02

TASK: Identify Copper Fittings and Pipe

STUDENT'S NAME ____________________ DATE ____________________

DIRECTIONS TO STUDENT: You will identify copper fittings and pipe. You will be evaluated for attainment of this task, based upon the items listed below.

CRITICAL ITEMS *	ITEMS TO BE EVALUATED: For Attainment, all items must receive a "YES" response.	YES	NO
1.	Was the 1/2" copper L identified?		
2.	Was the 1/2" metal adapter identified?		
3.	Was the 3/4" X 1/2" tee identified?		
4.	Was the 3/4" X 1/2" X 1/2" tee identified?		
5.	Was the 1/2" tee identified?		
6.	Was the 3/4" union identified?		
7.	Was the 1/2" pressure cap identified?		
8.	Was the 3.4" X 1/2" X 3/4" tee identified?		
9.	Was the 3/4" test cap identified?		
10.	Was the 3/4" coupling identified?		

Score ______

☐ MASTERY

☐ NON-MASTERY

EVALUATOR'S SIGNATURE ____________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	C	02		Page 1 of 1

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IN-9723-C-01

RIDGE
VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Fabricate a Copper Joint

DUTY: Cutting Pipe

PURPOSE:

The importance of understanding the correct procedure of fabricating copper joints cannot be overemphasized. The procedure recommended in the Learning Guide will assist you in making a correct joint.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	C	01	

REVISED :

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: material and specifications,

YOU WILL: Fabricate and test a copper joint.

HOW WELL: You must score at least 80% on the written test.

ENABLING OBJECTIVES:

1. Identify the different types of joints.
2. Make a compression joint.
3. Make a flare joint.
4. Make a solder joint.

DEPT.	PROG.	DUTY	TASK
IN	9723	C	01

ENABLING OBJECTIVE NO. 1

RVTC

Identify the different types of joints.

LEARNING STEPS

1. Read Resource #1 to identify the types of copper joints.
2. Complete the Self-Check.
3. Go on to Enabling Objective #2.

RESOURCES

1. a. Plumbing by the American Technical Society, pp. 38-42.
   b. Modern Plumbing, pp. 57-58. (located in the LRC)
2. Self-Check, enclosed.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	01	1

SELF-CHECK

RVTC

Answer the following questions:

1. Name the three types of joints.

____

____

____

Now, check your answers with the answer key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	1

ANSWER KEY

1. compression

   flare

   solder

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	1

ENABLING OBJECTIVE NO. 2

RVTC

Make a compression joint.

LEARNING STEPS

1. Study resource # 1 to identify the steps in making a compression joint.
2. Complete the Self-Check.
3. Practice making a compression joint and have your instructor check your work.
4. Go on to Enabling Objective # 3.

RESOURCES

1. Plumbing by the American Technical Society, p. 107.
2. Self-Check, enclosed.
3. a. tools
   b. materials
   c. instructor

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	C	01	2

SELF-CHECK

RVTC

Answer the following questions:

1. Name the four things (materials) needed to make a compression joint.

   a. ______________________________

   b. ______________________________

   c. ______________________________

   d. ______________________________

2. The seal is made by tightening the ______________________.

3. You assemble the parts in what order?

   a. ______________________________

   b. ______________________________

   c. ______________________________

4. What two tools are needed?

   a. ______________________________

   b. ______________________________

Now, check your answers with the answer key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	2

SELF-CHECK

RVTC

ANSWER KEY

1. a. compression fitting
   b. compression ring
   c. compression nut
   d. tubing
2. nut
3. a. nut
   b. ring
   c. fitting
4. a. wrench
   b. cutter

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	2

ENABLING OBJECTIVE NO. 3

RVTC

Make a flare joint.

LEARNING STEPS

1. Study Resource #1 to identify the steps in making a flare joint.
2. Complete the Self-Check.
3. Practice making a flare joint then have your instructor check your work.
4. Go on to Enabling Objective #4.

RESOURCES

1. Plumbing by the American Technical Society, p. 106 Figures 5-55 to 5-59.
2. Self-Check, enclosed.
3. a. tools
   b. materials
   c. instructor

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	3

SELF-CHECK

RVTC

Answer the following questions:

1. The two types of flaring tools are:

   a. ________________________________

   b. ________________________________

*2. Metal to metal contact is assured by removing all ________________________________.

*3. The ________________________________ must go on first impact.

4. Flaring tools are hit with ____________________ strokes.

5. Three steps that are the same with both tools are:

   a. ________________________________

   b. ________________________________

   c. ________________________________

6. The tubing is clamped in the flaring ____________________.

*Very important.

Now, check your answers with the answer key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	3

SELF-CHECK

RVTC

ANSWER KEY

1. a. impact
   b. screw type
2. burrs
3. nut
4. moderate
5. a. cut
   b. burr
   c. nut first
6. block

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	3

ENABLING OBJECTIVE NO. 4

RVTC

Make a solder joint.

LEARNING STEPS	RESOURCES
1. Study Resource #1 to identify the steps in making a soft solder joint and stick solder or silver solder joint.	1. a. Plumbing by the American Technical Society, pp. 102-106, Figures 5-39 to 5-54. b. Modern Plumbing by Blankenbaker, pp. 144-148 (located in LRC) c. Audel - Plumber and Pipefitter, pp. 9-14. (located in LRC)
2. View Resource #2 to identify the physical steps in making a solder joint.	2. Instructor Demonstration.
3. Complete the Self-Check.	3. Self-Check, enclosed.
4. Practice making a solder joint and have the instructor check your work.	4. a. tools b. materials c. instructor
5. When you think you can perform this task successfully, take the performance test for mastery.	5. Performance Test for task C-01.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	4

SELF-CHECK

RVTC

Answer the following questions:

1. Three basic types of solder are:

   a. ________________________

   b. ________________________

   c. ________________________

2. Silver solder is sometimes called ________________________.

3. All types of solder joints must have two other things. They are ________________________ and ________________________.

4. Material to be joined must be ________________________.

5. ________________________ should be applied to both pipe and fittings.

6. Soft solder joints should be ________________________ of excess.

7. ____________________solder is udes for extra strength.

8. A joint in water systems must hold ________________________.

9. We use ________________ ____________________ to clean copper pipe.

10. We use ________________ ____________________ to clean the socket of the fitting.

Now, check your answers with the answer key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	4

SELF-CHECK

ANSWER KEY

1. a. 50-50
   b. 95-5
   c. silver
2. brazed
3. flux and heat
4. clean
5. flax
6. wiped
7. silver
8. pressure
9. plumber clothes
10. fitting brushes

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	C	01	4

PERFORMANCE TEST FOR TASK NO. C-01

RVTC

IN-9723-C-01

TASK: Fabricate a copper joint

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will be given 4 pieces of 10" long 3/4" type soft copper, 3 elbows, 1 tec, sniffner valve, gage, pump. You will assemble a square, using a different ype joint at each corner and inflate it to 40 P.S.I. to hold for 1 hour.

DIRECTIONS TO EVALUATOR: Evaluate the student's procedure and product by using the check list below. Observe all safety items and critical items.

CRITICAL ITEMS *	ITEMS TO BE EVALUATED: (For Mastery, 80 %) of items- including all critical items, must have "Yes" responses).	YES	NO
*1.	Checked equipment for leaks		
*2.	Wore safety glasses		
*3.	Wore hard gloves		
*4.	Lit with stricker		
	Solder Joint		
*5.	Selected metal with proper part of flower		
*6.	Made sure solder flowered		
7.	Wiped off excess		
	Compression Joint		
*8.	Compressed the compression nut		
	Flare Joint		
*9.	Flared tubing to full size		

☐ MASTERY

Score ______ ☐ NON-MASTERY ______________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	# ITEMS	80 %	90 %
IN	9723	C	01		12	10	11

PERFORMANCE TEST FOR TASK NO. C-01 CONT'D

IN-9723-C-01

CRITICAL ITEMS *	ITEMS TO BE EVALUATED (CONT'D):	YES	NO
10.	Checked work for leaks.........................		
11.	Cleaned up area...............................		
12.	Straightened all pipes of soft copper..........		

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE
VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Repair a Water Closet

DUTY: Maintaining Plumbing

PURPOSE:

Since every building is required to have a water closet and lavatory it is necessary to be able to repair the water closet. However, the water closet is a difficult fixture to repair.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	10	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order and access to tools and supplies,

YOU WILL: repair a water closet.

HOW WELL: You must successfully complete the Written Test.

Your performance will be assessed by your instructor using the Performance Test on page 12.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify types of water closets.
2. Repair a water closet.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	10

ENABLING OBJECTIVE NO. 1

RVTC

Identify types of water closets.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the types of water closets and the parts used to repair a water closet.	1. a. Text: Plumbing Installation and Design, Chapter 10, pages 201 - 209. b. Text: Plumbing I, Unit 29, pages 71 - 72. c. Text: Do It Yourself Plumbing, pages 110 - 116.
2. Evaluate your knowledge by completing the Self-Check.	2. a. Self-Check enclosed. b. Text: Plumbing I, Review Questions, pages 72 - 73, c. Answer Key enclosed.
3. When you think you can attain this task, take the Written Test.	3. Written Test for task B-10.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	10	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below on a separate sheet of paper.

1. How many water closet bowl patterns are manufactured?
2. Name three different types of flushing actions found in water closets.
3. What is the difference in the construction of a close-coupled tank and bowl and a one-piece water closet?
4. Where would you most likely find a flushometer type water closet?
5. What are the two types of flushometer valves used today?

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	10	1

SELF-CHECK

RVTC

Answer Key

1. two: elongated and regular round front bowl.

2. 1. syphon jet 3. washdown
   2. reverse trap 4. blow out

3. On a close coupled water closet the tank and bowl are separate, the tank is bolted directly to the water close bowl with a rubber gasket. On a one-piece water closet, the flush tank and closet bowl are a single piece of vitreous china.

4. Schools, hospitals and commercial plumbing installations.

5. Diaphragm and piston

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	10	1

SELF-CHECK

RVTC

Answer Key

1. your personal answer
2. buoyancy of water on the float ball
3. when the tank is flushed
4. to replenish the water in the bowl to the proper level
5. water entering tank would be noisy
6. washer and locknut
7. flush ball may be swollen out of shape: guide bar may be off center: upper wire may be too short: upper wire may be caught on float rod of ballcock: the leak may come from a split overflow pipe.
8. bend the float rod up so that water reaches a high level before forcing the valve closed
9. shut off water, remove plunger, remove retaining cap, replace washer and reassemble
10. 8", 9", 10", 11" and 12"
11. see question No. 4, page 73
12. ¼" -- No. 20
13. copper, hard rubber and plastic
14. to flush the toilet quickly with a large volume of water -- at least six gallons
15. brass
16. center of the bottom
17. rubber gasket and lockwasher
18. overflow pipe
19. to carry off water, if the ballcock fails to close
20. refill tube
21. tank flush ball

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	10	1

SELF-CHECK

RVTC

Answer Key

22. the pressure of the water above
23. leak, waste water and stain the bowl
24. centered
25. gravity
26. 1" to 2"
27. water leaking into the bowl

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	10	1

ENABLING OBJECTIVE NO. 2

RVTC

Repair a water closet.

LEARNING STEPS

1. Using Resource No. 1, practice repairing a water closet.
2. Evaluate your work by completing the Self-Check.
3. When you think you can perform this task, take the Performance Test.

RESOURCES

1. a. Work order
   b. Tools
2. Self-Check enclosed.
3. Performance Test for task B-10.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	10	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was the water turned off?		
2. Was the proper tool selected?		
3. Was all water removed from tank?		
4. Was new ballcock installed?		
5. Was new tank ball installed?		
6. Was tank ball lined up to center flush valve?		
7. Were lift wires adjusted?		
8. Was water closet water level adjusted?		
9. Were all leaks repaired?		
10. Was work area cleaned?		
11. Were tools returned to tool room?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	10	2

WRITTEN TEST FOR TASK NO. B-10

RVTC

IN-9723-B-10

TASK: Repair a Water Closet

PAGE 1 **OF** 1

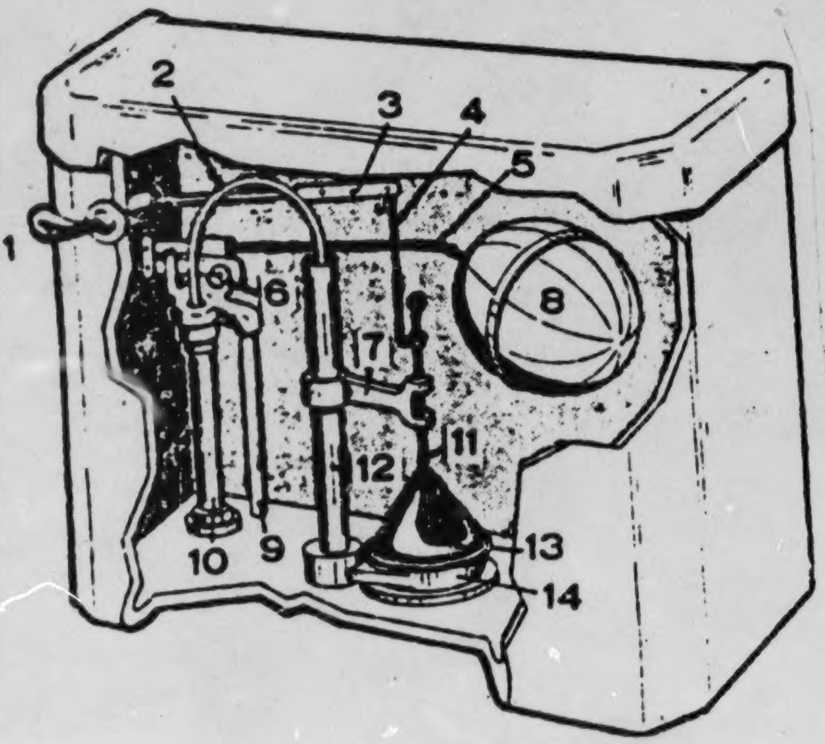
Directions

The purpose of this test is to determine if you fully understand how to repair a water closet. To successfully complete this test, all items must be answered correctly. For those items missed, see your instructor for a review, additional learning activities or retesting.

The items below are Matching. On the separate Answer Sheet, put the letter of the item which matches the diagram.

DO NOT MARK ON THIS TEST!

Matching questions



a. tank ball
b. flush valve
c. float ball rod
d. trip lever
e. hush tube
f. guide
g. upper liftwire
h. over flow tube
i. water closet tank
j. volume adjusting screw
k. float ball
l. ballcock assembly
m. lower lift wire
n. refill tube
o. trip lever
p. waste overflow

DEPT.	PROG.	DUTY	TASK
IN	9723	B	10

WRITTEN TEST FOR TASK NO. B-10

RVTC

TASK: Repair a Water Closet

ANSWER KEY

PAGE 1 OF 1

Multiple Choice questions

____1.
____2.
____3.
____4.
____5.
____6.
____7.
____8.
____9.
____10.
____11.
____12.
____13.
____14.
____15.
____16.
____17.
____18.
____19.
____20.
____21.
____22.
____23.
____24.
____25.

True-False questions

T F 1.
T F 2.
T F 3.
T F 4.
T F 5.
T F 6.
T F 7.
T F 8.
T F 9.
T F 10.
T F 11.
T F 12.
T F 13.
T F 14.
T F 15.
T F 16.
T F 17.
T F 18.
T F 19.
T F 20.
T F 21.
T F 22.
T F 23.
T F 24.
T F 25.

Matching questions

i 1.
n 2.
d 3.
g 4.
c 5.
j 6.
f 7.
k 8.
e 9.
l 10.
m 11.
h 12.
a 13.
b 14.
____15.
____16.
____17.
____18.
____19.
____20.
____21.
____22.
____23.
____24.
____25.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	10

IN-9723-B-10

PERFORMANCE TEST FOR TASK NO. B-10 | RVTC

TASK: Repair a Water Closet

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will repair a water closet. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was the water turned off?		
2.	Was the proper tool selected?		
3.	Was all water removed from tank?		
4.	Was new ballcock installed?		
5.	Was new tank ball installed?		
6.	Was tank ball lined up to center flush valve?		
7.	Were lift wires adjusted?		
8.	Was water closet water level adjusted?		
9.	Were all leaks repaired?		
10.	Was work area cleaned?		
11.	Were tools returned to tool room?		

Score ______ ☐ ATTAINED ☐ NOT ATTAINED

____
EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	10		Page 1 of 1

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IN-9723-B-09

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Repair Leaking Water Faucet or Valve

DUTY: Maintaining Plumbing

PURPOSE:

The repair of leaking faucets and valves will be a primary job for apprentice plumbers.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	B	09	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order and access to tools and supplies,

YOU WILL: repair leaking water faucet or valve.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 7.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify methods of repairing water faucets.
2. Repair water faucets or valves.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	09

ENABLING OBJECTIVE NO. 1

RVTC

Identify methods of repairing water faucets.

LEARNING STEPS

1. Read Resource No. 1 to identify methods of repairing water faucets.
2. As a Self-Check, complete Resource No. 2.
3. Go on to Enabling Objective No. 2.

RESOURCES

1. a. Text: Plumbing Installation and Design, pages 216, 219 and 221.
   b. Text: Plumbing I, Unit 51, page 121.
   c. Classroom charts
   d. Text: Do It Yourself Plumbing, pages 84 - 104.
2. a. Text: Plumbing I, Review Questions, page 122.
   b. Answer Key enclosed.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	09	1

SELF-CHECK

RVTC

Answer Key

1. chrome plated
2. chrome plated
3. your personal answer
4. to divert water to either tray
5. quick-pression stem has more pitch
6. hot water turns clockwise to close; cold turns counterclockwise
7. a spring
8. self-closing saves water.
9. American Standard pipe threads
10. right side, as one faces the sink

All of your answers should agree with the answers in the Anwer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	09	1

ENABLING OBJECTIVE NO. 2

RVTC

Repair water faucets or valves.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1, practice repairing faucets.	1. Tools
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task B-09.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	09	2

SELF-CHECK

RVTC

Directions

Evaluate your work by completing the items below.

All of your answers should receive a "YES" response.

		YES	NO
1.	Were proper tools selected?		
2.	Were faucets taken apart according to outlined procedures?		
3.	Was finish faucet protected?		
4.	Were washers checked?		
5.	Were screws checked?		
6.	Was faucet seat checked?		
7.	Was packing checked?		
8.	Was faucet reassembled according to outlined procedures?		
9.	Was stem put in right side?		
10.	Was faucet cleaned up?		
11.	Was faucet in operating condition?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	09	2

PERFORMANCE TEST FOR TASK NO. B-09 RVTC

IN-9723-B-09

TASK: Repair Leaking Water Faucet or Valve

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will repair water faucets or valves. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Were proper tools selected?		
2.	Were faucets taken apart according to outlined procedures?		
3.	Was faucet finish protected?		
4.	Were screws checked?		
5.	Were washers checked?		
6.	Was faucet seat checked?		
7.	Was packing checked?		
8.	Was faucet reassembled according to outlined procedures?		
9.	Was stem put in right side?		
10.	Was faucet cleaned up?		
11.	Was faucet in operating condition?		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ______________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	09		Page 1 of 1

IN-9723-B-08

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE

VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Remove Obstruction From Main Drainline

DUTY: Maintaining Plumbing

PURPOSE:

All buildings with plumbing have main drainlines or sewers. These main drainlines or sewers will sometimes become obstructed. You must be able to clear these lines and insure proper working condition of the plumbing.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	08	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order and tools,

YOU WILL: remove obstruction from main drainline,

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 7.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify steps in removing obstruction from main drainline.
2. Remove obstruction from main drainline.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	08

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in removing obstruction from main drainline.

LEARNING STEPS

1. Read Resource No. 1 to identify steps in removing obstruction from drainline.
2. Evaluate your knowledge by completing the Self-Check.
3. Go on to Enabling Objective No. 2.

RESOURCES

1. a. Text: Do It Yourself Plumbing, pages 127 - 134.
   b. Text: Basic Plumbing, Unit 52, page 189.
   c. Instruction Sheet enclosed, Removing Obstruction From Main Drainline
2. Text: Basic Plumbing, Review Questions, pages 190 - 191.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	08	1

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Removing Obstruction From Main Drainline

1. Obtain tools from tool room.
2. Locate sewer.
3. Remove clean out box cover and clean out plug.
4. Select proper cleaning head for cable and machine.
5. Insert cable into sewer line.
6. Always use the protective gloves that are provided with the machine.
7. Be sure the cable is in its protective shield when inserted in this machine.
8. Turn machine on.

   CAUTION: Be sure to turn switch to forward position.
9. Do not force the cable, feed it in by pushing the cable slowly.
10. The cables are in 15 foot lengths and are easily taken apart for convenience.

    NOTE: When a main drainline has an obstruction in it the water and waste materials will not flow through the lines. When the line is unstopped a reasonable amount of water will flow without any resistance.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	08	1

ENABLING OBJECTIVE NO. 2

RVTC

Remove obstruction from main drainline.

LEARNING STEPS	RESOURCES
1. Using Resource No. 1, practice removing an obstruction from a main drainline.	1. a. Sewer b. Tools
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task B-08.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	08	2

SELF-CHECK

RVTC

Directions

Evaluate your work by completing the items below.

All items should receive a "YES" response.

	YES	NO
1. Were proper tools used?	____	____
2. Was sewer located?	____	____
3. Was clean out cover located and removed?	____	____
4. Was clean out plug removed?	____	____
5. Was head selected for cable?	____	____
6. Were protective gloves worn?	____	____
7. Was machine run in proper direction?	____	____
8. Was cable fed into sewer?	____	____
9. Was cable retrieved from sewer?	____	____
10. Was clean out plug put back on line?	____	____
11. Was clean out cover put back?	____	____
12. Was area cleaned?	____	____
13. Were tools returned to tool room?	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	08	2

PERFORMANCE TEST FOR TASK NO. B-08

RVTC

IN-9723-B-08

TASK: Remove Obstruction From Main Drainline

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You sill remove obstruction from main drainline. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Were proper tools used?		
2.	Was sewer located?		
3.	Was clean out cover located and removed?		
4.	Was clean out plug removed?		
5.	Was head selected for cable?		
6.	Were protective gloves worn?		
7.	Was clean out machine operated according to directions?		
8.	Was sewer cable fed into machine according to outlined procedures?		
9.	Was cable retrieved from sewer?		
10.	Were all plugs reinstalled?		
11.	Was work area cleaned?		
12.	Were tools returned to tool room?		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ______________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	08		Page 1 of 1

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IN-9723-B-07

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A STUDENT LEARNING GUIDE

TASK: Remove Obstruction From Water Closet

DUTY: Maintaining Plumbing

PURPOSE:

An apprentice plumber will be frequently called upon to remove an obstruction from a water closet. You must be able to select the proper tools as well as remove the obstruction.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	07	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: water closet, and acess to, the tool room,

YOU WILL: remove obstruction from water closet.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 6.

ENABLING OBJECTIVES:

1. Identify tools used to remove an obstruction from a water closet.
2. Identify methods of removing obstructions from a water closet.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	07

ENABLING OBJECTIVE NO. 1

RVTC

Identify tools used to remove an obstruction from a water closet.

LEARNING STEPS

1. Read Resource No. 1 to identify the tools used to remove an obstruction from a water closet.
2. Evaluate your knowledge by completing Resource No. 2. Have your instructor check your work.
3. Go on to Enabling Objective No. 2.

RESOURCES

1. Text: Plumbing 1, Unit 42, page 100.
2. Text: Plumbing 1, Review Questions, page 101.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	07	1

ENABLING OBJECTIVE NO. 2

RVTC

Identify methods of removing obstructions from a water closet.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the methods used to remove an obstruction from a water closet.	1. a. Text: Do It Yourself Plumbing, pages 116 - 118. b. Text: Basic Plumbing, Unit 51, page 186.
2. Evaluate your knowledge by completing Resource No. 2. Have your instructor check your work.	2. Text: Basic Plumbing, Review Questions, pages 187 - 188.
3. Practice removing an obstruction from a water closet. If water closet must be removed and reset, see your instructor.	3. a. Tool room b. Instructor
4. Evaluate your work by completing the Self-Check.	4. Self-Check enclosed.
5. When you think you can perform this task, take the Performance Test.	5. Performance Test for task B-07.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	07	2

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below.

All items should receive a "YES" response.

		YES	NO
1.	Did student check to be sure toilet was clogged?.........		
2.	Was the plunger used first?..............................		
3.	Did student flush toilet, after using plunger to see if problem still exists?................................		
4.	Was flexible quger used?.................................		
5.	Was anything removed with flexible auger?................		
6.	Did auger go all the way through closet?.................		
7.	Was the water closet flushed to see if water closet was clear?...		
8.	Was water closet taken up anc checked farther?...........		
9.	Was precaution taken to protect water closet and bathroom?..		
10.	Was water closet installed properly and water checked?...		
11.	Was area cleaned and tools put away?.....................		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	07	

IN-9723-B-07

PERFORMANCE TEST FOR TASK NO. B-07 RVTC

TASK: Remove Obstruction From Water Closet

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will remove an obstruction from a water closet. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Did student check to be sure toilet was clogged?		
2.	Was the plunger used first?		
3.	Did student flush toilet, after using plunger to see if problem still exists?		
4.	Was flexible auger used?		
5.	Was anything removed with flexible auger?		
6.	Did auger go all the way through closet?		
7.	Was the water closet flushed to see if water closet was clear?		
8.	Was water closet taken up and checked farther?		
9.	Was precaution taken to protect water closet and bathroom?		
10.	Was water closet installed properly and water checked?		
11.	Was area cleaned and tools put away?		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED ________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	07		Page 1 of 1

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IN-9723-B-06

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PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Replace Lavatory Faucet and/or Pop Up Assembly

DUTY: Maintaining Plumbing

PURPOSE:

As a plumber you will be working on all types of faucets. Many times you will have to change a lavatory faucet and pop-up assembly. This task is essential for apprentice plumbers.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	06	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order to replace lavatory faucet and/or pop-up assembly and access to tools,

YOU WILL: replace lavatory faucet and/or pop-up assembly.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 16.

ENABLING OBJECTIVES:

1. Identify types of lavatory faucets.
2. Replace lavatory faucet.
3. Replace lavatory pop-up assembly.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	06

ENABLING OBJECTIVE NO. 1

RVTC

Identify types of lavatory faucets.

LEARNING STEPS

1. Read Resource No. 1 to identify the various types of lavatory faucets.
2. Evaluate your knowledge by completing the Self-Check.
3. Go on to Enabling Objective No. 2.

RESOURCES

1. a. Instruction Sheet enclosed, Lavatory Faucets
   b. Text: Plumbing Installation and Design, pages 214 - 218.
2. Self-Check enclosed.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	06	1

SELF-CHECK

Directions

Evaluate your knowledge by matching the types of materials with the types of lavatories on a separate sheet of paper.

1. Self rimming	a. acrylic plastic
2. Wall hung	b. cast iron
3. Under counter	c. porcelin steel
4. Corner	d. wood
5. Rim type	e. stainless steel

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	06	1

SELF-CHECK

RVTC

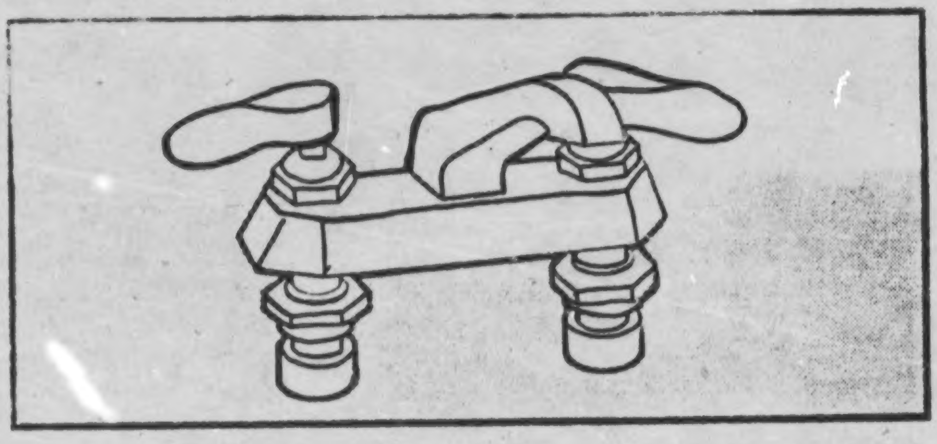
Answer Key

1. b or e
2. b or f
3. b or f
4. b or c
5. b or c

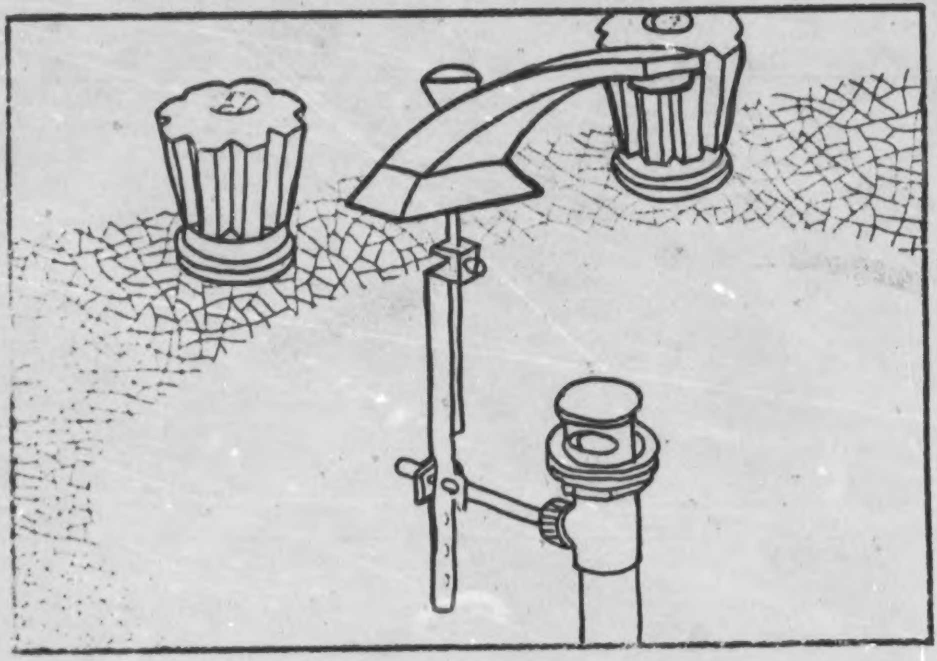
All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	06	1

FAUCETS



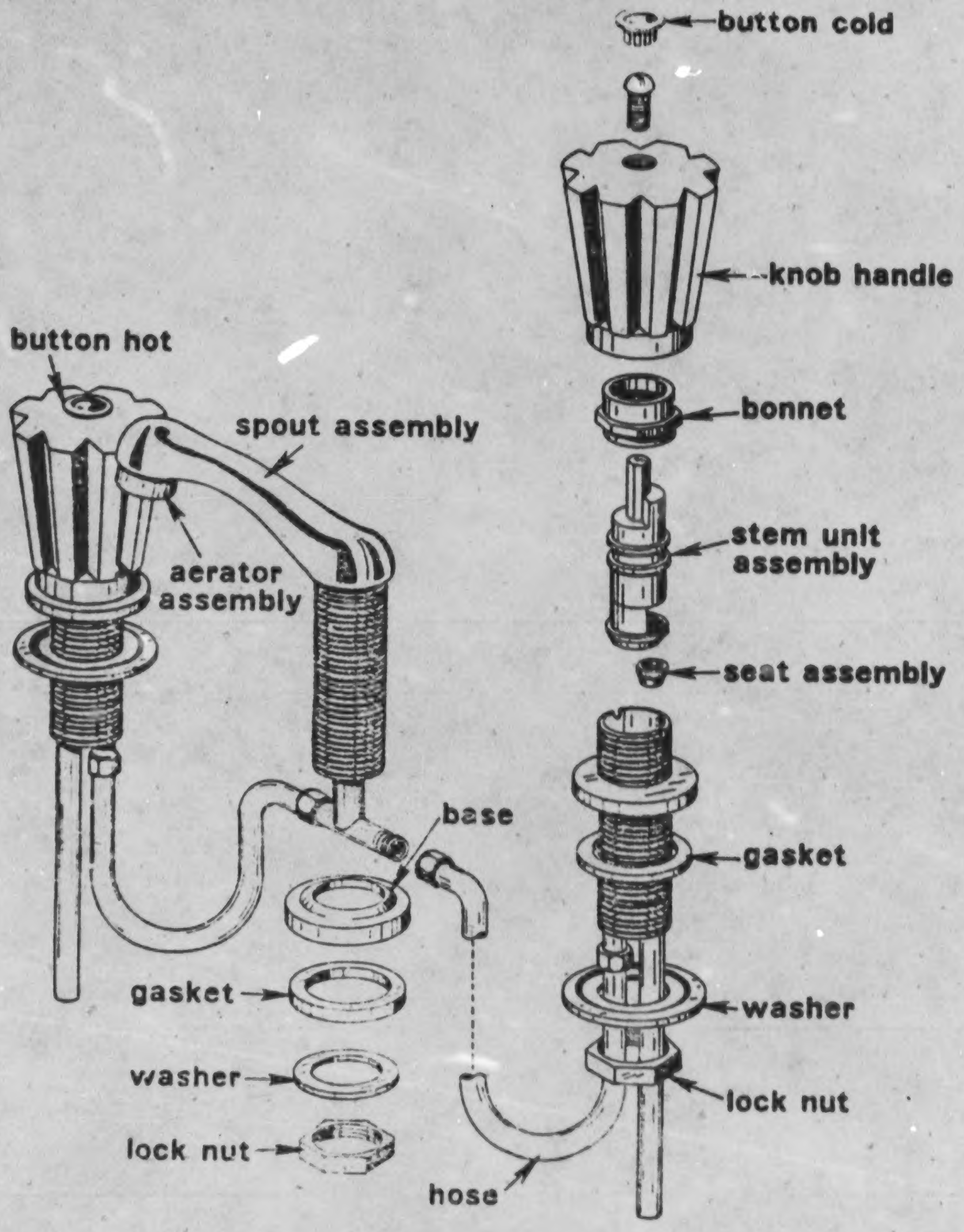
LAVATORY TWO VALVE 4" CENTER SET



WIDE SPREAD LAVATORY FAUCET
WITH POP-UP

fig 5

FAUCETS

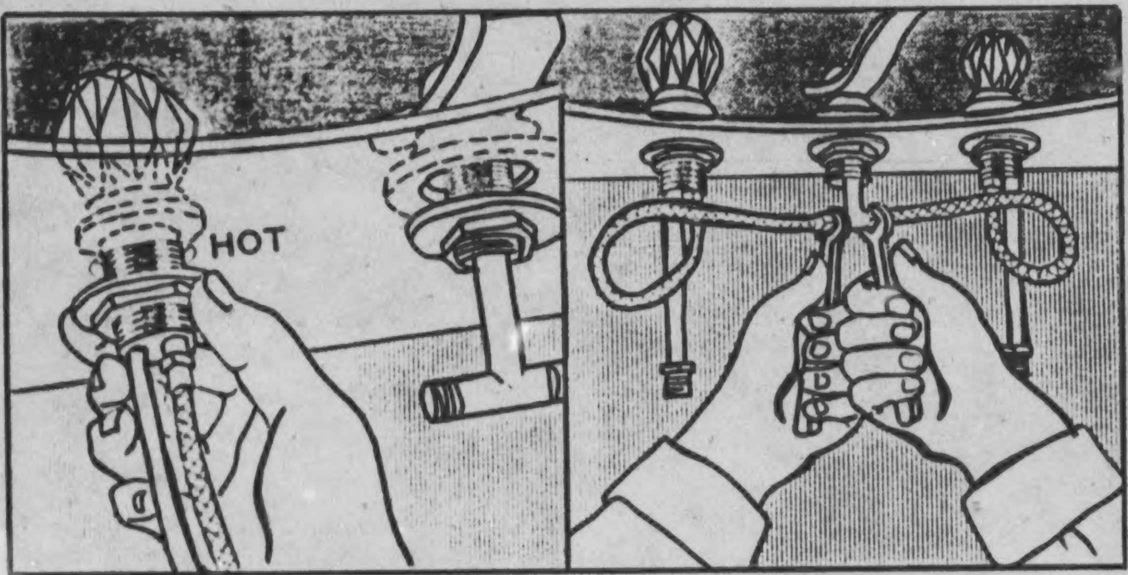

button cold
knob handle
button hot
bonnet
spout assembly
stem unit assembly
aerator assembly
seat assembly
base
gasket
gasket
washer
washer
lock nut
lock nut
hose

WIDE SPREAD LAVATORY FAUCET

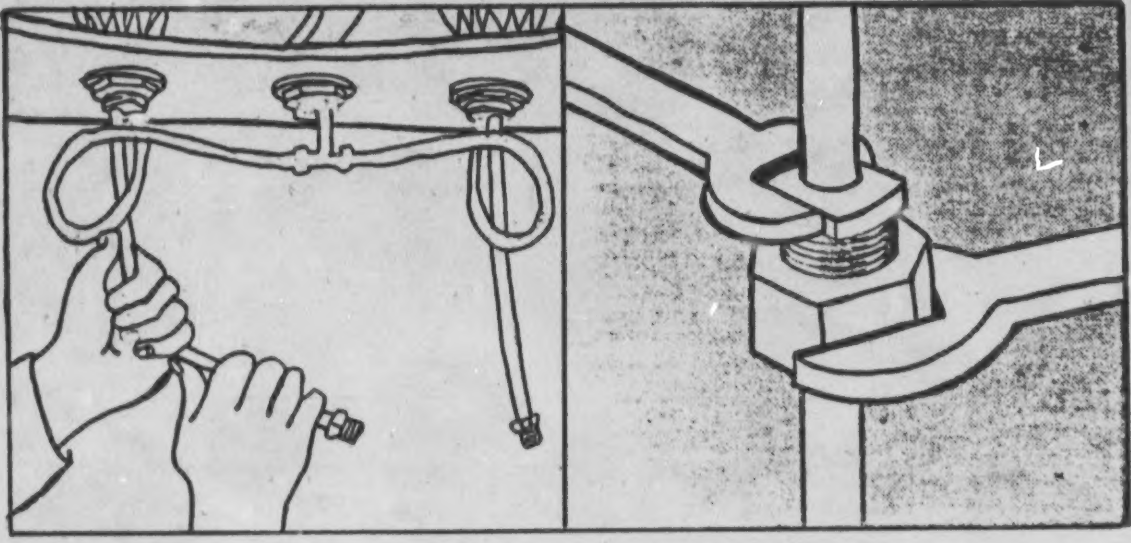
fig 15

Connecting faucet

FAUCETS



CONNECTING CONTROLS TO SPOUT OF WIDE SPREAD FAUCET



CONNECTING WIDE SPREAD FAUCET TO WATER SUPPLY

fig 17

ENABLING OBJECTIVE NO. 2

RVTC

Replace lavatory faucet.

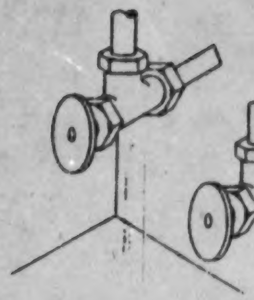
LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in replacing lavatory faucets.	1. Text: Do It Yourself Plumbing, page 84.
2. Read Resource No. 2 to identify steps in changing single-lever faucets.	2. Text: Do It Yourself Plumbing, pages 247 - 248.
3. Evaluate your knowledge by completing the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 3.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	06	2

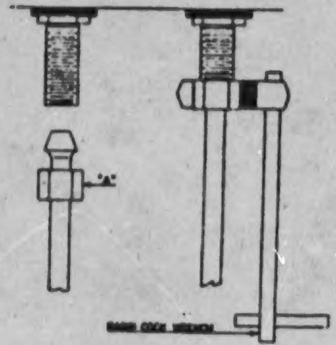
IN LLATION AND MAINTENANCE INSTRUCTIONS

GERBER (TM)

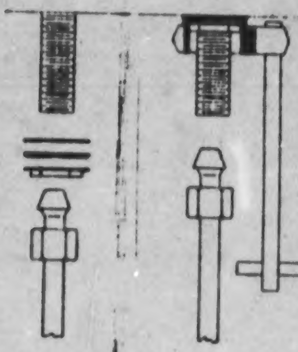
4" LAVATORY FITTING



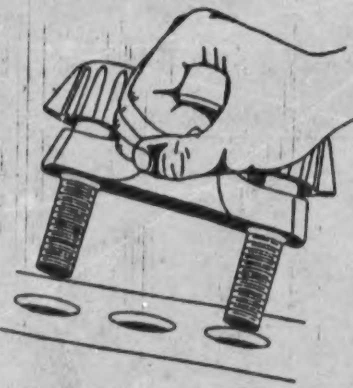
1. SHUT OFF MAIN WATER SUPPLY LINE OR INDIVIDUAL SHUT OFF VALVES UNDERNEATH THE LAVATORY. IF YOU DO NOT HAVE INDIVIDUAL SHUT OFFS PERHAPS THIS WOULD BE A GOOD TIME TO INSTALL THEM.



2. DISCONNECT THE WATER SUPPLY PIPES BY LOOSENING THE COUPLING NUTS "A". USE BASIN COCK WRENCH.



3. NEXT, USING THE BASIN COCK WRENCH REMOVE THE LOCK NUTS THAT HOLD YOUR FAUCET TO THE SINK (LAVATORY).



4. REMOVE THE OLD FAUCET AFTER GENTLY ROCKING BACK AND FORTH UNTIL THE OLD SEAL BETWEEN THE OLD FAUCET AND THE SINK (LAVATORY) HAS BEEN BROKEN.

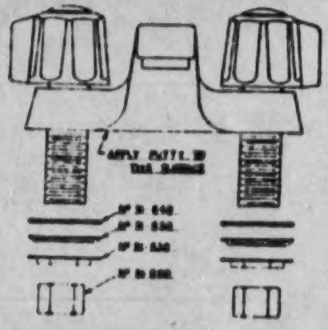
5. BE CERTAIN LAVATORY (SINK) IS CLEAN AND DRY AFTER REMOVING OLD FAUCET (IF THIS FAUCET IS TO BE INSTALLED ON A NEW LAVATORY, IT MAY BE BEST TO INSTALL THE FAUCET & DRAIN ASSEMBLY BEFORE LAVATORY IS MOUNTED.

253

NO. [illegible]

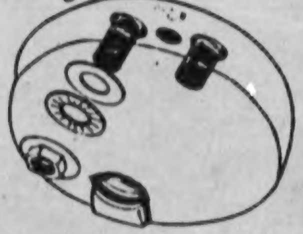
GERBER plumbing fixtures

Gerber Plumbing Fixtures Corp.
4656 West Touhy Ave., Chicago, Illinois 60646

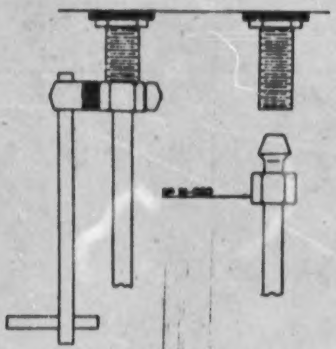


6. REMOVE THE FAUCET FROM THE CARTON, REMOVE THE COUPLING NUTS Nº 01-000, THE THREADED LOCKNUTS Nº 01-030 AND THE METAL WASHERS Nº 01-080 AND THE SEAL WASHERS Nº 01-040.

7. APPLY A COATING OF PUTTY TO THE BOTTOM SURFACE OF THE FAUCET. (THIS WILL FORM A SEAL BETWEEN THE FAUCET AND THE SINK (LAVATORY) TOP TO STOP WATER FROM SEEPING BENEATH THE FAUCET, THROUGH THE HOLES AND ONTO THE FLOOR.)



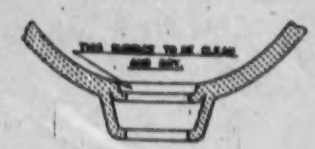
8. INSERT FAUCET THROUGH TWO HOLES IN LAVATORY, INSTALL SEAL WASHERS Nº 01-040, AND METAL WASHERS Nº 01-080 OVER INLET SHANKS AND THREAD LOCKNUTS Nº 01-030 FINGER TIGHT TO BOTTOM OF LAVATORY. POSITION FAUCET ON LAVATORY, THEN TIGHTEN LOCKNUTS UNTIL FAUCET IS HELD FIRMLY IN PLACE. CLEAN OFF EXCESS PUTTY.



9. CONNECT THE INLET SHANKS TO THE HOT AND COLD SUPPLY LINES USING THE COUPLING NUTS Nº 01-000.

IF THE DRAIN IS ALREADY INSTALLED AND CONNECTED, REMOVE [illegible]PER, TURN WATER BACK ON AND FLUSH OUT FAUCET BY [illegible]ITH HOT AND COLD WATER. REASSEMBLE AER- [illegible]ECK YOUR INSTALLATIONS FOR LEAKS.

TO INSTALL DRAIN



11. DISCONNECT AND REMOVE OLD DRAIN, BE CERTAIN SURFACE OF DRAIN HOLE IN LAVATORY IS CLEAN AND DRY.

254

10

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below on a separate sheet of paper.

1. Name three types of lavatory faucets.
2. What is the difference between a faucet and a valve?
3. What is the most common type of lavatory faucet?
4. What type wrench would you use to loosen or tighten a lavatory faucet?
5. Sometimes when you change a lavatory faucet you have to change the supply. What is the most common reason for changing a supply?

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	06	2

SELF-CHECK

Answer Key

1. centerset, concealed, single handle, single, faucets for wheel chain lavatories, and hospital faucets.
2. Center-set faucet
3. A valve can accept pipe from both ends, a faucet normally can't.
4. Basin wrench
5. Difference in the way lavatory faucets are built can make you change the supply. Your new faucets could have longer or shorter shank which would make your supply different.

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	06	2

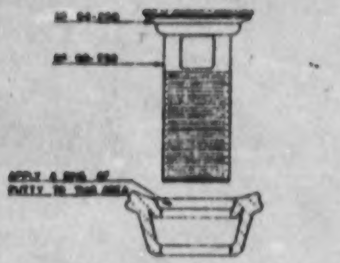
ENABLING OBJECTIVE NO. 3

RVTC

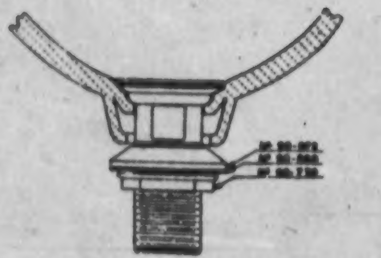
Replace a lavatory pop-up assembly.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify pop-up assemblies.	1. Instruction Sheet enclosed, Pop-Up Assembly
2. Read Resource material No. 2 to identify steps in changing pop-up.	2. Text: Do It Yourself Plumbing, pages 105 - 106.
3. Practice changing lavatory faucet and pop-up assembly.	3. Tools
4. Evaluate your knowledge by completing the Self-Check.	4. Self-Check enclosed.
5. When you think you can perform this task, take the Performance Test.	5. Performance Test for task B-06.

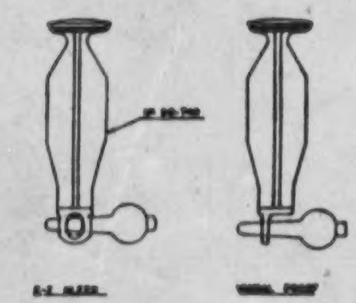
DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	06	3



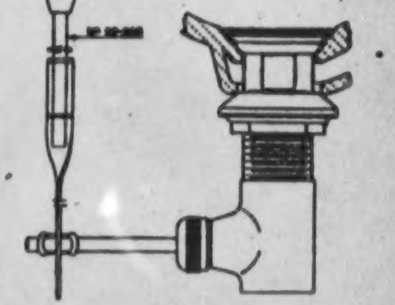
12. DISASSEMBLE THE DRAIN ASSEMBLY. INSTALL THE SEAL GASKET SP 90-290 OVER THE SHANK OF THE PLUG SP 90-730 UP AGAINST THE BOTTOM OF THE FLANGE. APPLY A RING OF PUTTY TO THE OPENING IN THE BOTTOM OF THE LAVATORY.



13. INSERT THE PLUG INTO THE DRAIN HOLE. FROM BENEATH THE LAVATORY, INSTALL THE BASIN GASKET SP 90-870 AND THE METAL WASHER SP 90-880 OVER THE THREADED PORTION OF THE PLUG. THREAD THE LOCKNUT SP 90-770 ON THE PLUG BUT DO NOT TIGHTEN.



16. INSPECT THE BOTTOM OF THE PLUNGER SP 90-740 TO DETERMINE IF YOU DESIRE THE PLUNGER TO BE PERMANENTLY INSTALLED OR INSTALLED TO BE LIFTED OUT FOR CLEANING WITHOUT DISASSEMBLY. IF PERMANENTLY INSTALLED DROP THE PLUNGER IN AT THIS TIME WITH THE LOOP AT THE BOTTOM OF THE PLUNGER FACING THE REAR. OTHERWISE, DO NOT INSTALL THE PLUNGER AT THIS TIME.

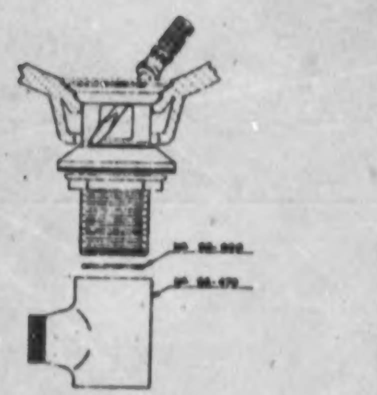


17. ASSEMBLE THE BALLROD (PLUNGER ACTUATOR) AS SHOWN. DROP IN THE LIFT ROD (POP-UP ROD) SP 90-000 THROUGH THE HOLE IN THE FAUCET AND FASTEN TO THE BALLROD AS SHOWN, LEAVING APPROXIMATELY ¼" BETWEEN THE BOTTOM OF THE POP-UP KNOB AND THE FAUCET WHEN THE DRAIN IS IN THE CLOSED POSITION.

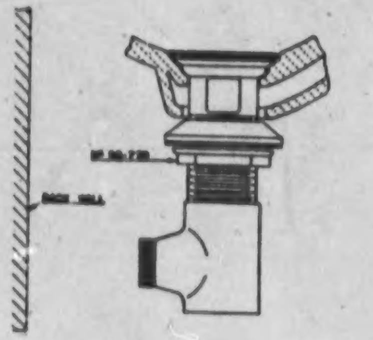
18. IF THE PLUNGER WAS NOT INSTALLED IN STEP 16 ABOVE, DROP THE PLUNGER INTO THE PLUG SO THAT IT SEATS WHEN THE EXPOSED END OF THE BALLROD IS IN IT'S UPWARD POSITION.

MAINTENANCE:

IN CLEANING FAUCET, DO NOT USE ACIDS OR ABRASIVES AS THEY WILL DAMAGE THE CHROMIUM FINISH. USE A WARM DAMP CLOTH TO CLEAN AND WIPE DRY WITH A SOFT CLOTH.



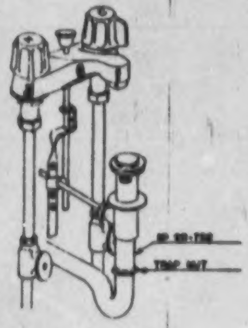
14. PLACE THE FIBER GASKET SP 90-900 IN THE TEE SP 90-470 AND THREAD THE TEE ONTO THE BOTTOM OF THE PLUG BY HOLDING THE PLUG 90-730 BY INSERTING A SCREWDRIVER FROM INSIDE THE LAVATORY THROUGH ONE OF THE RECTANGULAR HOLES IN THE PLUG SP 90-730. TIGHTEN THE TEE TO MAKE A WATER TIGHT SEAL.



15. POSITION THE WHOLE ASSEMBLY SO THAT THE SIDE OUTLET OF THE TEE IS FACING THE BACK WALL AND TIGHTEN NUT SP 90-770.

CAUTION — TIGHTEN NUT SP 90-770 ONLY TIGHT ENOUGH TO BRING THE LIP OF PLUG SP 90-730 IN CLOSEST PROXIMITY TO THE LAVATORY.

CAUTION - OVERTIGHTENING THE LOCKNUT COULD CAUSE DAMAGE TO THE LAVATORY.



19. PLACE TAILPIECE SP 90-792 INTO DRAIN PIPE OR DRAIN TRAP USING PIPE COMPOUND ON THE THREADS. THREAD TAILPIECE INTO BOTTOM OF THE TEE THEN TIGHTEN THE TRAP NUT.

NOTE REFER TO BINDER PAGE FOR PARTS LIST

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was the old pop-up assembly removed properly?		
2. Was the lavatory cleaned of old putty?		
3. Was pipe dope put on the threads of the tailpiece before it was screwed into P.O. plug?		
4. Was new putty used under strainer?		
5. Was ball-rod properly adjusted?		
6. Was the pop-up assembly water checked?		
7. Were any leaks repaired?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	06	3

PERFORMANCE TEST FOR TASK NO. B-06

RVTC

IN-97230B-06

TASK: Replace Lavatory Faucet and/or Pop-Up Assembly

STUDENT'S NAME ____________________ DATE ____________

DIRECTIONS TO STUDENT: You will replace a lavatory faucet and pop-up assembly. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was the water turned off first?		
2.	Was the lavatory faucet properly removed?		
3.	Was the pop-up assembly removed properly?		
4.	Was old putty removed from lavatory?		
5.	Was new putty put under new lavatory faucet?		
6.	Were supplies changed, if necessary?		
7.	Was new putty used on P.O. plug?		
8.	Was threaded tailpiece doped?		
9.	Were pop-up assemblies installed properly?		
10.	Were faucet and pop-up assembly water checked?		
11.	Were any leaks repaired?		
12.	Was lavatory cleaned of old putty and pipe dope?		
13.	Were all tools cleaned and returned to tool room?		

Score ____________

☐ ATTAINED

☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ____________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	06		Page 1 of 1

RIDGE VO-TECH CENTER 1980

IN-9723-B-05

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE
VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Replace a Kitchen Sink Faucet and/or Basket Strainers

DUTY: Maintaining Plumbing

PURPOSE:

A frequent duty of apprentice plumbers is to replace kitchen sink faucets and/or basket strainers. You will be required to replace these items.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	05	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order to replace kitchen sink faucet or sink basket strainer and access to tool room,

YOU WILL: replace kitchen sink faucet and/or basket strainers.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on pages 11-12.

ENABLING OBJECTIVES:

1. Identify steps in replacing a kitchen sink faucet.
2. Identify steps in replacing a basket strainer.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	05

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in replacing kitchen sink faucet.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify tools used in changing a faucet and the water supply.	1. Instruction Sheet enclosed, Tools
2. Read Resource No. 2 to identify the steps in changing a sink faucet. Do review questions as you go.	2. a. Text: Plumbing I, Unit 50, page . b. Text: Plumbing Installation and Design, page 222. c. Text: Do It Yourself Plumbing, page 98.
3. Evaluate your knowledge by completing the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 2.	

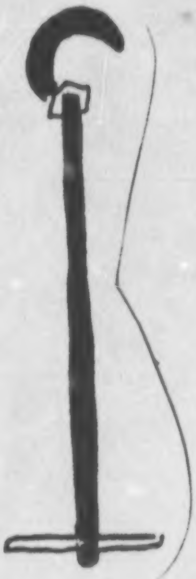
DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	05	1

INSTRUCTION SHEET **RVTC**

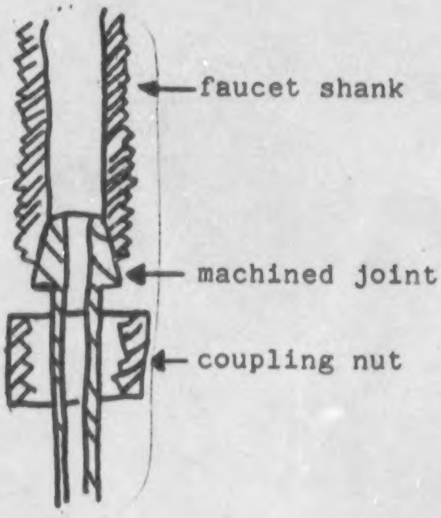
PAGE 1 OF 1

Tools

Basin wrench is used to tighten and loosen supply nuts or nuts that secure a faucet to a fixture.



Basin wrench


faucet shank
machined joint
coupling nut

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	05	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. The best method to connect the water supply to a faucet shank is with a machined joint.
2. The machined joint and coupling nut make up what is known as a ground joint.
3. The use of the ground joint is the only method to be used in connecting a supply to a faucet.
4. When facing the faucet, the hot water is always on the left and the cold on the right.
5. Sink faucets are available as combination compression faucets or as port control faucets.
6. An attachment that can be bought on a bathroom sink faucet that you could use for rinsing dishes is a flexible hose and spray head.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	05	1

SELF-CHECK

RVTC

Answer Key

1. T
2. T
3. F
4. T
5. T
6. F

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	05	1

ENABLING OBJECTIVE NO. 2

RVTC

Replace a basket strainer.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify steps in replacing a basket strainers.	1. a. Instruction Sheet enclosed, Basket Strainers b. Text: Plumbing I, Unit 54, page 127, Do review questions. c. Text: Plumbing Installation and Design, page 223. d. Text: Do It Yourself Plumbing, page 63.
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task B-05.

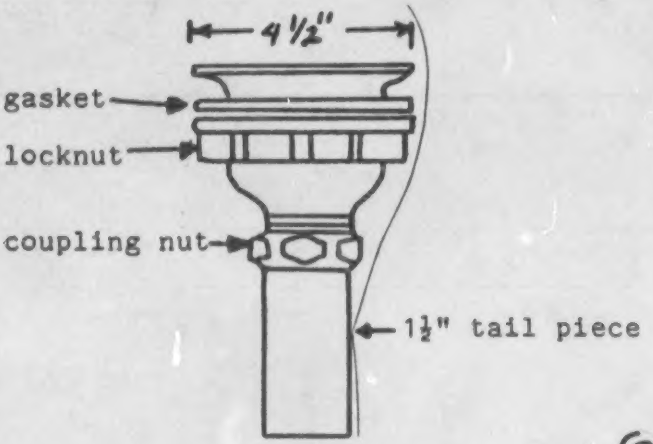
DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	05	2

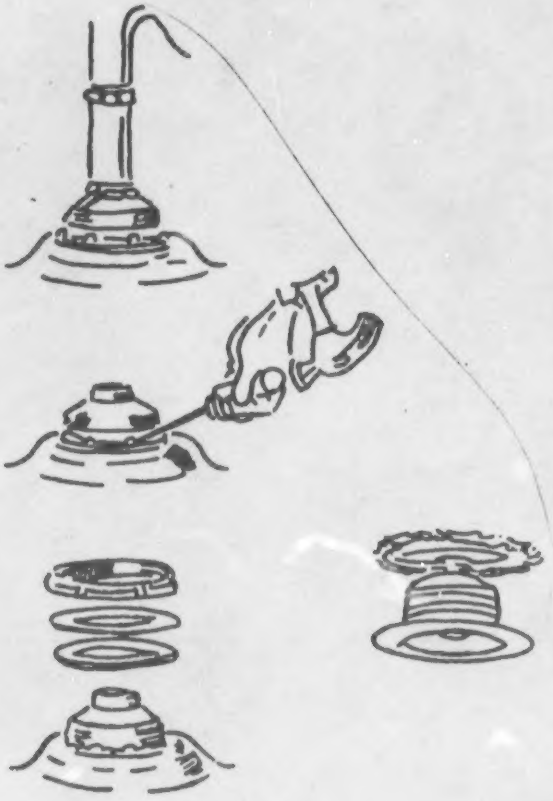
INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Basket Strainers


4½"
gasket
locknut
coupling nut
1½" tail piece



DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	05	2

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below.

1. What is used to make the hole in the sink for a strainer watertight?
2. What holds the strainer tight and in place?
3. What is the size of the tailpiece?
4. How is the tailpiece attached to the strainer?
5. What are the two types of strainers?
6. What is the difference in a duplex strainer and a basket strainer?

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	05	2

SELF-CHECK

RVTC

Answer Key

1. Putty is palced on the inside; a rubber gasket on the outside.
2. The locknut.
3. 1½".
4. Place the gasket between the tailpiece and tighten the coupling nut.
5. Duplex strainer and improved strainer better known as a basket strainer.
6. A basket strainer has a drain plug with crumb cup and stopper.

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	05	2

PERFORMANCE TEST FOR TASK NO. B-05 RVTC

IN-9723-B-05

TASK: Replace Kitchen Sink Faucet and/or Basket Strainers

STUDENT'S NAME ____________________ DATE ____________________

DIRECTIONS TO STUDENT: You will replace a kitchen sink faucet and/or a basket strainer. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was the water turned off?		
2.	Was the basin wrench used to loosen supply nuts?		
3.	Were supplies taken down out of the way?		
4.	Was spray hose loosened, if necessary?		
5.	Was sink ledge cleaned before the new faucet was installed?		
6.	Was putty put under new sink faucet?		
7.	Was faucet pulled down evenly and straight?		
8.	Was supply installed properly?		
9.	Was faucet water checked?		
10.	Were any leaks repaired?		
11.	Was old basket strainer taken out of sink?		
12.	Was water from trap caught in container and disposed of?		
13.	Was putty put under strainer?		

Score ______ ☐ ATTAINED ☐ NOT ATTAINED ____________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	B	05	

Page 1 of 2

RIDGE VO-TECH CENTER 1980

PERFORMANCE TEST FOR TASK NO. B-05 CONT.

IN-9723-B-05

ITEM NO.	ITEMS TO BE EVALUATED (CONT.):	YES	NO
14.	Was basket strainer installed in the sink with writting facing the front?		
15.	Were new slipnut washers used?		
16.	Was the old trap inspected before being put back on?		
17.	Was new trap installed, if necessary?		
18.	Was the strainer and waste system water tested after the installation?		
19.	Was work area cleaned and tools put away?		

PAGE 2 OF 2

IN-9723-B-04

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE
VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Replace a Kitchen Sink Trap or Disposal Trap

DUTY: Maintaining Plumbing

PURPOSE:

Since the kitchen sink is one of the most widely used plumbing fixtures, it must be maintained properly. The area under a kitchen sink is used for storage, therefore, the traps on a sink and disposal unit get knotted around quite a bit. As a beginning plumber you will be asked to change these traps.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	04	

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order to change trap on a kitchen sink or garbage disposal and access to tool room and supplies,

YOU WILL: change trap on kitchen sink or disposal unit.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

ENABLING OBJECTIVES:

1. Identify steps in changing kitchen sink trap or garbage disposal trap.
2. Replace kitchen sink trap or disposal trap.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	04

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in changing kitchen sink trap or garbage disposal trap.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in changing a kitchen sink or garbage disposal trap.	1. Instruction Sheet enclosed, Replacing a Trap
2. Evaluate your knowledge by co completing the Self-Check.	2. Self-Check enclosed.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	04	1

INSTRUCTION SHEET **RVTC**

PAGE 1 OF 2

Replacing a Trap

1. Obtain necessary tools from the tool room.

2. Obtain a small vessel, such as a small pan, to catch the water from the trap.

3. Put vessel or pan under trap.

4. With adjustable pliers or slick jawed spud wrench loosen the slipnuts on the trap.

5. Once the slipnuts have been loosened you can take them the rest of the way off by hand.

6. Lower trap letting the water that spills go into the pan.

7. Lay this portion of trap (J-bend) aside.

8. With your adjustable pliers or spud wrench loosen the slipnut on the waste arm that is against the wall.

9. Take the waste arm out. A new waste arm will come with your new p-trap kit.

10. Open your new p-trap kit and take all the parts out. In this kit you have a new J-bend, a waste arm, two 1 ½" slipnuts and two 1½" slip washers.

11. A trap needs three 1½" slipnuts and washers so you must furnish one new slipnut and washer.

12. Put two slipnuts and washers on the waste arm-one for each connection. Be sure slip washers do not have a twist in them, they must be straight.

13. Put new slipnut and washer on tailpiece from sink or disposal.

14. Slip new J-bend into the tailpiece and line up and start the slipnut on the waste arm.

15. With your adjustable pliers spud wrench snug the slipnuts.

16. You are now ready to water check trap.

17. Run about two inches of water into sink, let the water out and

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	04	1

INSTRUCTION SHEET

RVTC

PAGE 2 OF 2

check for leaks. If any leaks have developed tighten the slipnut more and recheck.

18. Pour the water from your pan or vessel into the sink to dispose of it.
19. Clean up your mess-clean the sink, you work area and the cabinet.
20. Return tools or any other materials to the tool room.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	04	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below.

All items should receive a "YES" response.

YES NO

1. Were tools obtained from tool room?........................ ____ ____
2. Was a small vessel used to catch spilled water from old trap?.. ____ ____
3. Were either adjustable pliers or a spud wrench used to loosen slipnuts?.. ____ ____
4. Were the J-bend and waste arm replaced?.................. ____ ____
5. Was the trap kit inspected to be sure all parts were there?... ____ ____
6. Were parts assembled properly?............................. ____ ____
7. Was trap installed properly?................................ ____ ____
8. Was the sink or disposal checked by running a proper amount of water in it?.. ____ ____
9. Was it checked for leaks?.................................. ____ ____
10. Were leaks repaired?....................................... ____ ____
11. Was work area cleaned?..................................... ____ ____
12. Were tools replaced?....................................... ____ ____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	04	1

ENABLING OBJECTIVE NO. 2

RVTC

Replace a kitchen sink trap or a disposal trap.

LEARNING STEPS	RESOURCES
1. Practice changing a kitchen sink trap or disposal trap.	1. Tools
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task B-04.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	04	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was a pan used to catch the water?		
2. Were adjustable pliers or spud wrench used?		
3. Were slipnuts carefully loosened to allow the water to drain?		
4. Were J bend and waste arm disposed of?		
5. Were washers inspected to be sure they were free of twists?		
6. Were slipnuts tightened snugly?		
7. Was the sink water checked using at least two inches of water?		
8. Was work area cleaned?		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	04	1

PERFORMANCE TEST FOR TASK NO. B-04

RVTC

IN-9723-B-04

TASK: Replace a Trap on a Kitchen Sink or Disposal

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will replace a trap on a kitchen sink and/or garbage disposal unit. You will be evaluated for attainment of this task, based upon the items listed below.

CRITICAL ITEMS *	ITEMS TO BE EVALUATED: For Attainment, all items must receive a "YES" response.	YES	NO
1.	Was a small vessel used to catch water?............		
2.	Were pliers or spud wrench used to remove slipnuts?..		
3.	Was the J-bend and waste arm replaced?............		
4.	Was trap assembled properly?............		
5.	Was trap installed properly?............		
6.	Was sink water checked using at least two inches of water?............		
7.	Were all leaks repaired?............		
8.	Was the work area cleaned?............		

☐ MASTERY

Score ______ ☐ NON-MASTERY ______________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	B	04	

Page 1 of 1

IB-9723-B-03

RIDGE VOTECH CENTER

PLUMBING AND PIPEFITTING

RIDGE
VO-TECH CENTER

P.O. BOX 1537
HAINES CITY, FLORIDA

A STUDENT LEARNING GUIDE

TASK: Remove Obstruction from Kitchen Sink Drain

DUTY: Maintaining Plumbing

PURPOSE:

The kitchen sink is one of the most used fixtures in a home. One of the most common problems with a sink is stoppage. You must know how to unstop it safely and properly.

DEPT.	PROG.	DUTY	TASK	PREREQ.
IN	9723	B	03	

©RIDGE VO-TECH CENTER [illegible]

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order to unstop kitchen sink and access to tool room and supplies,

YOU WILL: remove obstruction from kitchen sink drain.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

ENABLING OBJECTIVES:

1. Identify steps in removing obstruction from kitchen sink drain.
2. Remove obstruction from kitchen sink drain.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	03

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ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in removing obstruction from kitchen sink drain.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify tools and materials used in removing obstruction from kitchen sink drain.	1. Instruction Sheet enclosed, Tools
2. Read Resource No. 2 to identify process of removing obstruction from kitchen sink drain. Do the review questions as you go.	2. a. Text: Plumbing I, Unit 43, page 102. b. Text: Basic Plumbing, Unit 51, pages 186 - 187, Unit 52, pages 189 - 191. c. Text: Do It Yourself Plumbing, page 122.
3. Evaluate your knowledge by completing the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	03	1

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Tools

The following tools will be used in removing an obstruction from a kitchen sink.

Adjustable pliers are used to remove the slipnuts.

Plunger is used to unstop the waste arm.

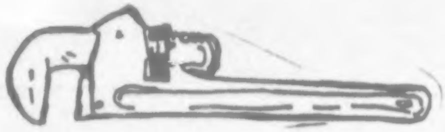
Slick jawed wrench is used to remove the slipnuts from the trap if it it is necessary to remove the trap.

Pipe wrench is used to remove the clean out plug in order to use the flexible cable.

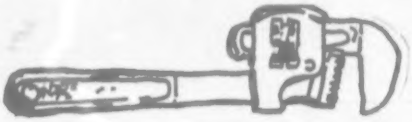
Crescent wrench may also be used to remove the clean out plug.

Flexible cable is used to cable line in order to remove the obstruction.

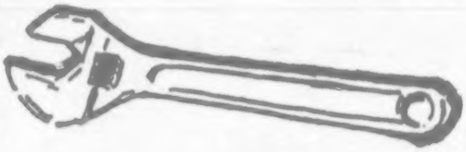
Slick jawed wrench



Pipe wrench



Crescent wrench



DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	03	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. The kitchen sink drain is most likely to be clogged with grease.
2. The cleaning tool used to remove obstruction on a kitchen sink is a flexible cable.
3. Stoppage in a sink trap may be removed by a wire inserted through the drain.
4. In more severe cases of stoppage by grease, cut a hole in the pipe at the stoppage.
5. You should always use chemicals after the drain has stopped up completely.
6. Chemical and acid type cleaners are best on grease and hair.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	03	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. The kitchen sink drain is most likely to be clogged with grease.
2. The clearing tool used to remove obstruction on a kitchen sink is a flexible cable.
3. Stoppage in a sink trap may be removed by a wire inserted through the drain.
4. In more severe cases of stoppage by grease, cut a hole in the pipe at the stoppage.
5. You should always use chemicals after the drain has stopped up completely.
6. Chemical and acid type cleaners are best on grease and hair.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	03	1

SELF-CHECK

RVTC

Answer Key

1. T
2. T
3. T
4. F
5. F
6. T

All of your answers should agree with the answers in the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	03	1

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was a plunger used to see if only the trap was stopped up?..	____	____
2. Was the strainer on the other side held down to stop up that side of the sink, when a plunger was used?.....	____	____
3. Did you check to see if the drain line had a clean out plug?..	____	____
4. If a flexible cable was used, did you run it through the clean-out?.......................................	____	____
5. Was the flexible cable used through the stack?.........	____	____
6. After you have used the flexible cable did you properly check the trap and under the kitchen sink for leaks and repair them?...	____	____
7. Did a normal amount of water flow through the waste?...	____	____
8. Was the clean-out plug replaced?.......................	____	____
9. Were tools returned to the tool room?..................	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	03	2

PERFORMANCE TEST FOR TASK NO. B-03

RVTC

IN-9723-B-03

TASK: Remove Obstruction From Kitchen Sink

STUDENT'S NAME ____________________ **DATE** ____________

DIRECTIONS TO STUDENT: You will clear obstruction from a kitchen sink drain. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was a plunger used?..............		
2.	When plunger was used, was other strainer held down to prevent water from coming up other side of sink?..............		
3.	Was a clean-out checked for?..............		
4.	Was flexible cable used through clean-out (if one)?..............		
5.	Was flexible cable used through stack (if no clean-out)?..............		
6.	Was trap checked for leaks?..............		
7.	Did a normal amount of water flow through waste in final check?..............		
8.	Was clean-out plug properly reinstalled?..............		
9.	Was area cleaned and tools put away?..............		

Score ________ ☐ ATTAINED ☐ NOT ATTAINED

________________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	03		Page 1 of 1

RIDGE VO-TECH CENTER 1980

ENABLING OBJECTIVE NO. 2

RVTC

Remove obstruction from kitchen sink drain.

LEARNING STEPS	RESOURCES
1. Practice identifying problems and unstopping kitchen sink drains.	1. Tools
2. Evaluate your work by completing the Self-Check.	2. Self-Check enclosed.
3. When you think you can perform this task, take the Performance Test.	3. Performance Test for task B-03.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	03	2

IN-9723-B-02

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RIDGE

VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Replace a Lavatory Trap

DUTY: Maintaining Plumbing

PURPOSE:

Lavatory traps are made of tubular brass coated with chrome. Since they are made of metal they corrode and break. You must know how to replace them in order to be a successful plumber.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	B	02	

REVISED:				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order for replacing a lavatory trap and access to tool room and supplies,

YOU WILL: replace lavatory trap.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 8.

NOTE:

IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify steps in replacing a trap.
2. Replace a lavatory trap.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	02

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in replacing a trap.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the various traps and the necessary tools.	1. a. Text: Plumbing Installation and Design, pages 167 - 180. b. Instruction Sheet enclosed, Various Traps and Tools
2. As a Self-Check complete Resource No. 2.	2. Text: Plumbing Installation and Design, Review questions - page 180.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	02	2

INSTRUCTION SHEET

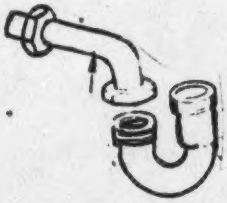
RVTC

PAGE 1 OF 1

Various Traps and Tools

P-trap -- Every fixture has a trap under it or built-in. Lavatory traps are made of tubular brass with chrome plating and are exposed. Since these traps are made of metal they sometimes corrode or break. The P-trap is composed of two parts:

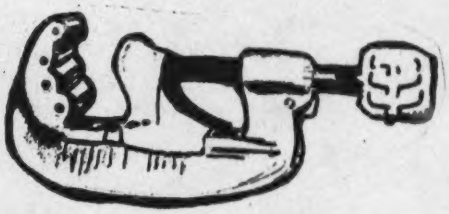
(1) J bend -- this holds the water and creates a seal.
(2) Waste arm -- this connects the J bend to the waste connection in the wall.



1½" chrome P-trap

Adjustable pliers will be used due to their ability to open and close quickly.

Tubing cutter -- this tool cuts smoother and faster than the hacksaw. This is the best tool to use if the waste arm must be shortened.



DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	02	1

ENABLING OBJECTIVE NO. 2

RVTC

Replace a lavatory trap.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify the steps in replacing a lavatory trap.	1. Instruction Sheet enclosed, Replacing a Lavatory Trap
2. Practice replacing a lavatory trap. Have your instructor check your work,	2. Tools
3. Evaluate your work by completing the Self-Check.	3. Self-Check enclosed.
4. When you think you can perform this task, take the Performance Test.	4. Performance Test for task B-02.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	02	2

INSTRUCTION SHEET

RVTC

PAGE 1 OF 1

Replace a Lavatory Trap

1. Obtain a small pan to put under the trap to catch water that spills when you remove the trap.
2. Loosen the two slipnuts with adjustable pliers and carefully lower the trap.
3. Pour any water in the trap into the small pan.
4. Inspect the trap to see if it has any corroded or broken places.
5. Replace the two washers that are under the slipnuts.
6. Put the old trap back on or if it is bad put the new replacement on. Line the trap up with the pipes and lift up.
7. Start the slipnuts with the new washers, turn in a clockwise direction to start.
8. Snug the slipnuts with your adjustable pliers.
9. Run water in the lavatory and check for leaks.
10. If any leaks, tighten a little more with adjustable pliers and check water again.
11. Pour the water from the pan into the lavatory or water closet.
12. Clean up any mess in your work area and put up your tools.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	02	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below.

All items should receive a "YES" response.

	YES	NO
1. Was a vessel or a pan used to catch the water from the old trap when it was removed?	____	____
2. Were all the slipnuts loosened before the trap was removed?	____	____
3. Were adjustable pliers or slick jawed monkey wrench used to remove trap?	____	____
4. Were the new slipnuts used with the new trap?	____	____
5. Were new slip washers used?	____	____
6. Was the trap water checked?	____	____
7. Were all leaks repaired?	____	____
8. Was the pan with trap water disposed of?	____	____
9. Was work area cleaned?	____	____
10. Were tools returned to tool room?	____	____

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	02	2

PERFORMANCE TEST FOR TASK NO. B-02

RVTC

IN-9723-B-02

TASK: Replace a Lavatory Trap

STUDENT'S NAME ______________________ DATE ______________

DIRECTIONS TO STUDENT: You will replace a lavatory trap. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was a vessel or a pan used to catch the water from trap?		
2.	Were slipnuts loosened before trap removed?		
3.	Were adjustable pliers or slick jawed monkey wrench used to remove trap?		
4.	Were new slipnuts used?		
5.	Were all new slip washers used?		
6.	Was the trap water checked?		
7.	Were all leaks repaired?		
8.	Was the water from the pan disposed of?		
9.	Was the work area cleaned?		
10.	Were tools returned to tool room?		

Score ________

☐ ATTAINED

☐ NOT ATTAINED

EVALUATOR'S SIGNATURE ______________________

DEPT.	PROG.	DUTY	TASK	ATTEMPT	
IN	9723	B	02		Page 1 of 1

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RIDGE
VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

IN-9723-B-01

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Clear Obstructions From a Lavatory Drain

DUTY: Maintaining Plumbing

PURPOSE:

As a beginning plumber, you should know how to maintain fixtures and install them. A frequent duty will be to clear obstructions from lavatory drains. As a successful plumber, you will depend upon this type of work.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	B	01	

REVISED:				
6/80				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: a work order for an obstructed lavatory, and access to the tool room and supplies,

YOU WILL: clear obstruction from a lavatory drain.

HOW WELL: You must score 100% on the Performance Test.

ENABLING OBJECTIVES:

1. Identify steps in clearing obstruction from lavatory drain.
2. Clear obstruction from a lavatory drain.

DEPT.	PROG.	DUTY	TASK
IN	9723	B	01

ENABLING OBJECTIVE NO. 1

RVTC

Identify steps in clearing obstruction from lavatory drain.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify tools and materials needed to clear obstructions from lavatory drains and types of lavatories.	1. Instruction Sheet enclosed, Tools and Various Fixtures
2. Read Resource No. 2 to identify the procedure for clearing obstructions from a lavatory drain.	2. Text: Do It Yourself Plumbing, pages 122, 125 - 136.
3. Evaluate your knowledge by completing the Self-Check.	3. Self-Check enclosed.
4. Go on to Enabling Objective No. 2.	

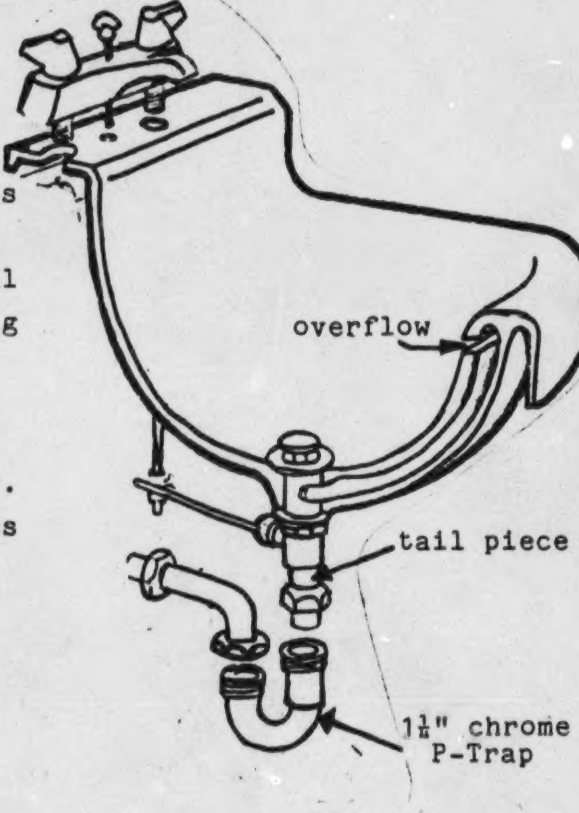
DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	01	1

INSTRUCTION SHEET **RVTC**

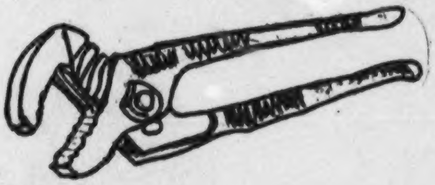
PAGE 1 OF 2

Tools and Various Fixtures

Wall hung lavatory cutaways show built in over-flows. All lavatories have over-flows built into them. P-traps contain water to form a seal to prevent sewer gases from entering the home.

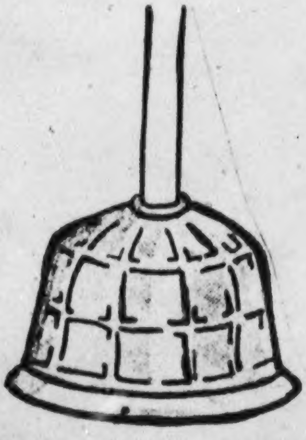


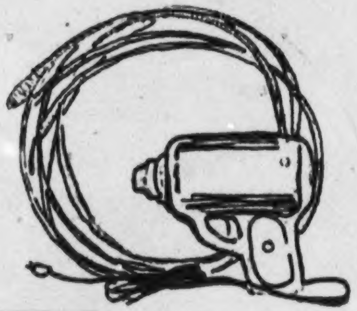
Adjustable pliers are used to take slipnuts off the trap, if necessary. The adjustability of this tool makes it very handy.



The plunger (vacuum plunger) is used to unstop lavatories, sinks, shower drains and toilets.

Snake and Drill (Flexible Cable) is used if the line has to be rodded.





DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	01	1

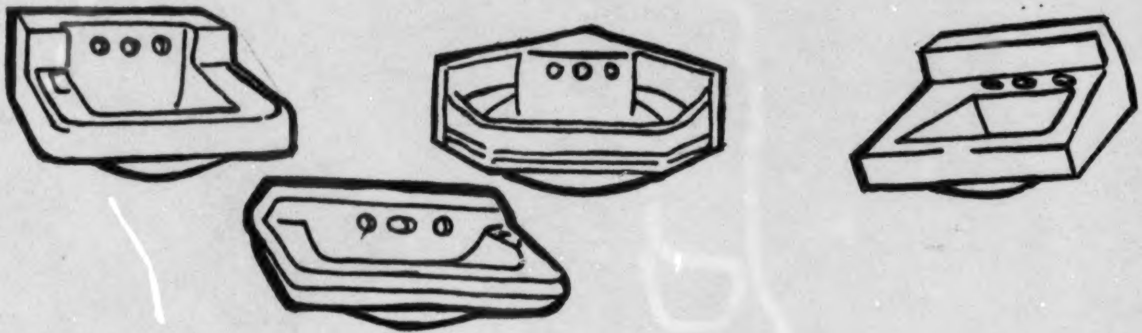
INSTRUCTION SHEET

RVTC

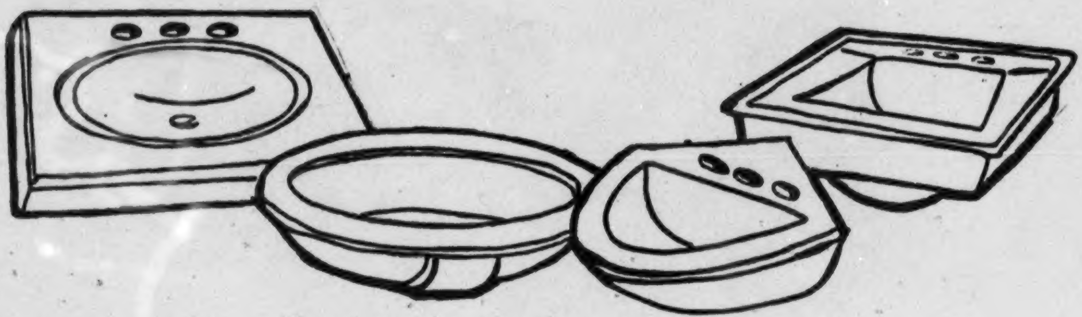
PAGE 2 OF 2

Fixtures

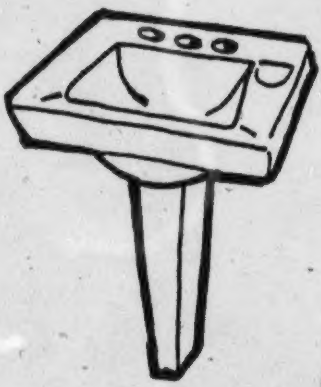
Wall-Hung Lavatories

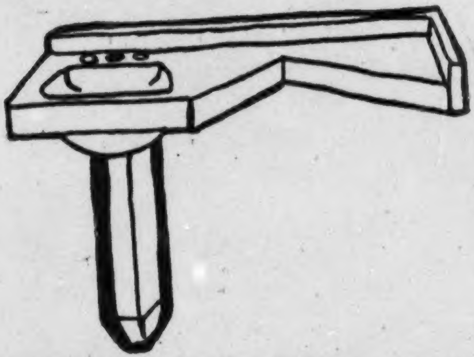


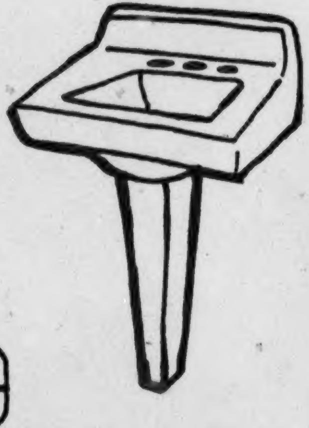
Built-In Lavatories



Pedestal Type Lavatories







DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	01	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering True or False to the items below on a separate sheet of paper.

1. A screwdriver should be used to unstop the P.O. plug.
2. To remove the stopper out of a lavatory, you turn it slightly and pick up on it.
3. Before taking the trap off the lavatory, you should get a pan to catch the water.
4. To remove a trap off a lavatory, you tighten the slipnuts and let the trap down.
5. If there is an obstruction in the trap, you rod the line with a flexible cable.

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	01	1

SELF-CHECK

RVTC

Answer Key

1. F
2. T
3. T
4. F
5. T

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	01	1

ENABLING OBJECTIVE NO. 2

RVTC

Clear obstruction from a lavatory drain.

LEARNING STEPS

1. Using Resource No. 1, practice clearing an obstruction from a lavatory drain and replace the trap.
2. Evaluate your work by completing the Self-Check.
3. When you think you can perform this task, take the Performance Test.

RESOURCES

1. a. Instruction Sheet enclosed Replacing a Trap
   b. Instructor
2. Self-Check enclosed.
3. Performance Test for task B-01.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	B	01	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below on a separate sheet of paper.

All items should receive a "YES" response.

		YES	NO
1.	Was a normal amount of water run through the lavatory to determine if it was actually clogged?.....		
2.	Was the overflow stopped up with a rag?...............		
3.	Was all hair and foreign matter removed from the stopper?..		
4.	Was the stopper removed?..............................		
5.	Was the plunger used by holding the rag secure with one hand and using the plunger with the other?........		
6.	Was pan placed under trap before removing the trap?...		
7.	Was the trap removed and checked for stoppage?........		
8.	Was P-trap inspected?.................................		
9.	Was trap cleaned and replaced?........................		
10.	Were new slip washers used?...........................		
11.	Was proper stopper put back in lavatory and was the water flow checked?..................................		
12.	Was water in pan disposed of properly?................		
13.	Was work area cleaned?................................		
14.	Were tools replaced?..................................		

If you received a "NO" response for any item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	01	2

INSTRUCTION SHEET **RVTC**

PAGE 1 OF 1

Replacing A Trap

You have now checked the stopper for blockage from hair and foreign material. You have taken the trap off and checked it for obstruction and rodded the line with a flexible cable.

1. Inspect the trap; if damaged, replace it with a new one.
2. Install the trap; always use new slip washers under the slipnuts.
3. Tighten the slipnuts on the trap snugly.
4. Turn on the water; a normal amount of water should go out the drain.
5. Check for leaks; repair any you might have.
6. Dispose of the water in the pan by pouring it in the water closet or lavatory.
7. Clean the work area.
8. Clean your tools and put them away.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	B	01	2

PERFORMANCE TEST FOR TASK NO. B-01

RVTC

TASK: Clear Obstruction From Lavatory Drain

IN-9723-B-01

STUDENT'S NAME ____________________ DATE ____________________

DIRECTIONS TO STUDENT: You will be given a work order calling for clearing an obstruction from a lavatory drain. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED: For successful attainment ALL items must receive a "YES" response.	YES	NO
1.	Was a normal amount of water run through the lavatory to determine if it was actually clogged?		
2.	Was the overflow stopped up with a rag?		
3.	Was all hair and foreign matter removed from the stopper?		
4.	Was the stopper removed?		
5.	Was the plunger used by holding the rag secure with one hand and using the plunger with the other?		
6.	Was pan placed under trap before removing trap?		
7.	Was the trap removed and checked for stoppage?		
8.	Was P-trap inspected?		
9.	Was trap cleaned and replaced?		
10.	Were new slip washers used?		
11.	Was proper stopper put back in lavatory and was the water flow checked?		
12.	Was water in pan disposed of?		
13.	Was work area cleaned and tools put away?		

Score ________

☐ ATTAINED

☐ NOT ATTAINED

________________________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	B	01	

Page 1 of 1

RIDGE VO-TECH CENTER 1980

BIBLIOGRAPHY

Alth, Max, Do It Yourself Plumbing, Harper & Row, New York, 1975.

IN-9723-E-01

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RIDGE
VO-TECH CENTER

7700 State Road 544 N
Winter Haven, Florida 33880

PLUMBING AND PIPEFITTING

A STUDENT LEARNING GUIDE

TASK: Set a Bathtub

DUTY: Topping Out Plumbing

PURPOSE:

The majority of today's homes have bathtubs. As a plumber you must be able to set a bathtub. Setting, leveling and connecting the waste for a bathtub is a necessary skill for plumbers.

DEPT.	PROG.	DUTY	TASK	PRE REQ.
IN	9723	E	01	

REVISED :				

STUDENT PERFORMANCE OBJECTIVES: RVTC

TERMINAL PERFORMANCE OBJECTIVE:

GIVEN: work order to set a bathtub,

YOU WILL: set bathtub, level the tub and connect the tub waste.

HOW WELL: Your performance will be assessed by your instructor using the Performance Test on page 9.

NOTE:
IF YOU THINK YOU CAN ALREADY PERFORM THIS TASK TO THE LEVEL INDICATED IN THE TERMINAL PERFORMANCE OBJECTIVE ABOVE, SEE YOUR INSTRUCTOR.

ENABLING OBJECTIVES:

1. Identify types of bathtubs.
2. Set a bathtub.

DEPT.	PROG.	DUTY	TASK
IN	9723	E	01

ENABLING OBJECTIVE NO. 1

RVTC

Identify types of bathtubs.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 to identify types of bathtubs.	1. a. Text: Plumbers and Pipefitters Library, pages 214 - 224. b. Text: Plumbing, Third Edition, pages 121 - 427. c. Text: Plumbing Design and Installation, pages 218 - 220. d. Plumbing I, Unit 52
2. Evaluate your knowledge by completing Resource No. 2.	2. a. Text: Plumbing I, Review Questions 1 - 8 on pages 123 - 124.
3. Go on to Enabling Objective No. 2.	

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	E	01	1

SELF-CHECK

RVTC

Directions

Evaluate your knowledge by answering the items below on a separate sheet of paper.

1. Name three most commonly used materials in the manufacturing of bathtubs.
2. What is the advantage of using over-the-rim type supplies, than using under-the-rim type?
3. Name two most commonly used drain fixtures for bathtubs.
4. All bathtubs are furnished with either a right-hand or left-hand outlet for what purpose?
5. The bottom of the tub should slope toward the outlet at a slope of about what?
6. What may be caused by the use of under-the-rim type supply fixture?
7. Name four ways bathtubs are installed.
8. Three standard lengths of bathtubs are:
9. The Bureau of Health Codes requires connected waste and overflows to be in what sizes?

Now check your answers with the Answer Key.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9273	E	01	1

SELF-CHECK

RVTC

Answer Key

1. enameled cast-iron, fiberglassed (reinforced plastic), enameled steel
2. permits an unlimited variety of locations with an ease of installation
3. combination lever-operated pop-up, combination stoppered type
4. to permit installation along any bathroom wall
5. 1/8 inch per foot
6. back siphonage
7. recessed, sunken, corner, Peninsular
8. 4½', 5', 5½'
9. 1½", 1¼"

All of your answers should agree with the answers on the Answer Key. If you missed any, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	E	01	1

ENABLING OBJECTIVE NO. 2

RVTC

Set a bathtub.

LEARNING STEPS	RESOURCES
1. Read Resource No. 1 describing how to set a tub.	1. Text: Do It Yourself Plumbing, pages 215 - 220.
2. Following the steps outlined in Resource No. 2, practice setting a tub and connecting waste and overflow.	2. Instruction Sheet enclosed, Setting a Bathtub
3. Evaluate your work by completing the Self-Check.	3. Self-Check enclosed.
4. When you think you can perform this task, take the Performance Test.	4. Performance Test for task E-01.

DEPT.	PROG.	DUTY	TASK	EN.OBJ.
IN	9723	E	01	2

INSTRUCTION SHEET

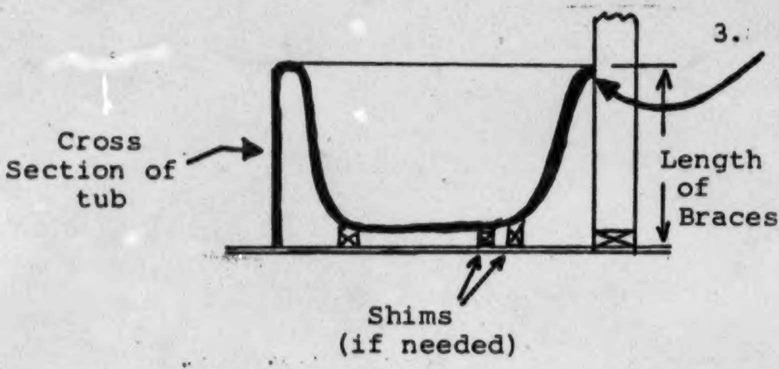
RVTC

PAGE 1 OF 1

Setting a Bathtub

1. Remove tub from crate (if necessary) and inspect for chips or other damage.

2. Set tub in place temporarily and level both ways. Shim as needed to level.



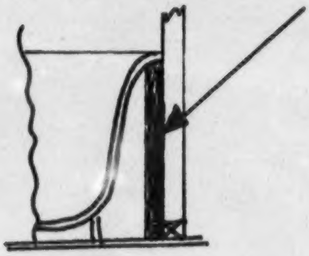
3. Reach between studs and mark location of ledge with a pencil. Mark 2 studs - both ends of tub.

4. Pull tub out of place far enough to install brace.

5. Rather than using a horizontal brace, using two vertical braces will insure that the tub will never sag due to nails pulling out over the years. To find the length of the two braces, measure from the marks you just made to the floor.

6. Measure and cut two vertical braces (2 x 4).

7. Nail braces into place at both ends of tub.



8. Put tub back in place snug against studs.

9. Check for level again.

10. Connect waste and overflow.

11. Water check and repair any leaks.

DEPT	PROG	DUTY	TASK	EN OBJ
IN	9723	E	01	2

SELF-CHECK

RVTC

Directions

Evaluate your work by answering the items below on a separate sheet of paper.

All items should receive a "YES" response.

	YES	NO
1. Was tub inspected for chips or defects?................	____	____
2. Were two braces attached to wall to support back of tub?...	____	____
3. Was tub leveled - both ways?............................	____	____
4. Was waste connected, adjusted and water checked?.......	____	____

If you received a "NO" response for *any* item, go back and repeat one or more of the Learning Steps for this Enabling Objective.

DEPT.	PROG.	DUTY	TASK	EN. OBJ.
IN	9723	E	01	2

PERFORMANCE TEST FOR TASK NO. E-01 RVTC

IN-9723-E-01

TASK: Set a Bathtub

STUDENT'S NAME ____________ **DATE** ____________

DIRECTIONS TO STUDENT: You will be given a work order for setting a tub. You are to uncrate, set and level the tub and connect waste and overflow. You will be evaluated for attainment of this task, based upon the items listed below.

ITEM NO.	ITEMS TO BE EVALUATED For successful attainment ALL items must receive a "YES" response	YES	NO
1.	Was tub inspected for chips or defects?..........		
2.	Were two braces attached to wall to support back of tub?..........		
3.	Was tub leveled - both ways?..........		
4.	Was waste connected, adjusted and water checked?..........		

☐ ATTAINED

Score ________ ☐ NOT ATTAINED ________ EVALUATOR'S SIGNATURE

DEPT.	PROG.	DUTY	TASK	ATTEMPT
IN	9723	E	01	

Page 1 of 1